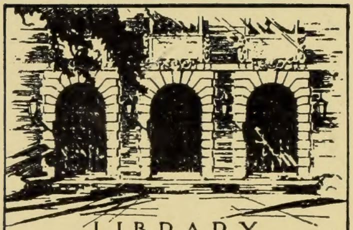

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L. III JUNE, 1906 NO. 3

BULLETIN
OF
BROWN UNIVERSITY

ANNOUNCEMENT OF COURSES
1906-1907

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UNIVERSITY OF ILLINO

WOMEN'S COLLEGE EDITION

PROVIDENCE
PUBLISHED BY THE UNIVERSITY
[APRIL, MAY, JUNE, OCTOBER, DECEMBER, & FEBRUARY]

red as second-class matter April 1, 1905, *at the Post Office at Providence, R. I., under Act of Congress of July* 16, 1894

ANNOUNCEMENT OF COURSES
OFFERED AT
THE WOMEN'S COLLEGE
IN
BROWN UNIVERSITY
1906–1907

THE LIBRARY OF THE
MAR 24 1931
UNIVERSITY OF ILLINOIS.

PROVIDENCE, RHODE ISLAND
PUBLISHED BY THE UNIVERSITY
1906

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1906/07-1914/15

GENERAL ANNOUNCEMENTS

FOR

THE ACADEMIC YEAR

1906–1907

⁂

THE Academic Year begins with chapel service in Pembroke Hall, at 9 a.m., on Wednesday, September 19.

For information regarding Entrance Examinations, Registration and Enrolment of Undergraduates and Graduates, and Requirements for the various Degrees, see pages 5 to 15 of this Announcement. The following special announcements relate to the Women's College. Undergraduates must register at the Registrar's Office, in Pembroke Hall, between 9 a.m. and 12 m., or between 2 p.m. and 4 p.m., on September 17 and 18. Undergraduates in residence must return their registration cards to the Registrar not later than June 10. Graduate students register at the office of the Registrar of the University.

COURSES OF INSTRUCTION

*A FULL description of each course, with a statement of the conditions of admission to it, may be found on pages 16–83. Courses designated by a † are given at the University, and women are admitted to them on the recommendation of the Dean. Women may also be admitted to other University courses not announced here, with the special permission of the department and with the consent of the Dean. In courses designated by a * a final mark covering the work of the course as a whole will be given at the end of the course, the marks given at the end of the preceding term or terms being regarded as temporary.*

ART

1, 2, 3. *History of Art from Antiquity through the Renaissance*
Professor POLAND.
Tu., Wed., Sat., at 9.25.

10. *Freehand Drawing*

11. *Practical Work in Art*

ASTRONOMY

1, 2, 3. *General Course*
Professor UPTON.
Wed., Fri., Sat., at 11.25.

BIBLICAL LITERATURE AND HISTORY

13. *Hebrew and Early Jewish History and Literature*
Professor FOWLER.
Mon., Wed., Fri., at 12.25.

15.† *Biblical Seminary*

BOTANY

1. *Introductory Course*
Professor COLLINS.
Three hours. First Term. *Tu., Wed., Sat., 9.25 to 11.15.*

3, 4, 5.† *Cryptogams*

6.† *Investigation*

CHEMISTRY

1, 2, 3. *Descriptive Chemistry*
Professor BUCHER *and Mr.* BABASINIAN.

4, 5.† *Qualitative Analysis*

6.† *Quantitative Analysis*

COMPARATIVE ANATOMY

2.† *Anatomy*

3.† *Bacteriology*

4.† *Histology*

5.† *Advanced Histology*

7.† *Chemical Physiology*

8.† *Physical Physiology*

9.† *Anatomy of the Nervous System*

17.† *General Physiology and Hygiene*

20. *Household Economics*

Aims to teach the principles applicable in the construction of an ideal house, with special reference to economy and to the health and industrial activity of its occupants. Includes a detailed study of foods and their physiological value, also of the physiology and hygiene of the human body. *Miss* Wilcox.

Three hours. Six hours of attendance. Through the year. Elective for all Undergraduates. *Mon., Fri., at 2.25.* Third hour to be arranged with the instructor.

22. *General Biology*

Designed as an introduction to biology and to serve the purposes of general culture. A thorough study of the anatomy and physiology of the cat; introduction to scientific methods; general biological principles as illustrated by typical plants and animals. *Miss* Wilcox.

Three hours. Six hours of attendance. Through the year. Elective for all Undergraduates. *Tu., Wed., Sat., 9.25 to 11.15.*

ENGLISH LITERATURE AND LANGUAGE

1.* *Rhetoric and Composition*

Messrs. Latham, Grose, Hastings, *and* MacMinn.

Tu., Th., Sat., at 12.25.

4.* *Argumentative Composition*
Professor Huntington.
Tu., Fri., Sat., at 10.25.

7.* *Public Speaking*
Professor Crosby.
Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.25.*

11. *English Literature from the Beginning to the Present Time*
Professor Bronson.
Mon., Th., Fri., at 9.25.

17. *English Literature from 1660 to 1798*
Professor Huntington.
Wed., Fri., Sat., at 11.25.

19. *English Literature from 1798 to 1832*
Professor Benedict.
Mon., Wed., Th., at 10.25.

25. *Old and Middle English*
English literature and language in representative extracts from Beowulf to Chaucer. Grammatical details subordinated as far as practicable to the study of the literature. Intended to serve the purposes of general culture and designed especially for those who expect to become teachers of English. *Professor* Potter.
Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors.
Tu., Wed., Sat., at 9.25.

GEOLOGY

3.† *Mineralogy and Lithology*

6.† *Dynamical and Structural Geology*

7.† *Physiographical and Historical Geology*
Courses 3, 6, 7 are open to a limited number of Seniors.

10, 12, 15.† *Physiography*
Courses 10, 12, 15 are open to a limited number of Juniors and Seniors.

GERMANIC LANGUAGES AND LITERATURES

1. *Introductory Course*
Mr. Norris.
Mon., Wed., Fri., at 12.25.

2. *Intermediate Course*
Professor Jonas.
Mon., Wed., Fri., at 12.25.

3, 4, 5. *Drama of the Classic Period*
Professor Crowell.
Mon., Wed., Fri., at 12.25.

7. *Advanced Course in Standard Authors*
Professor von Klenze.
Mon., Wed., Fri., at 12.25.

10.† *Goethe's Faust*

8.† *Composition*

12, 13, 14.† *German Literature*

15.† *Middle High German*

22.† *Grillparzer and Hebbel*

GREEK LITERATURE AND HISTORY

A, B, C. *Elementary Course*
Mr. ———.
Tu., Fri., Sat., at 10.25.

1. *Lysias*
Professor Manatt.
Tu., Fri., Sat., at 10.25.

2. *Plato*
Professor Allinson.
Tu., Fri., Sat., at 10.25.

3. *Homer*
Professor Manatt.
Tu., Fri., Sat., at 10.25.

4. *Lucian*
Professor Allinson.
Mon., Tu., Th., at 10.25.

5. *Greek Lyric Poets*
Professor Manatt.
Mon., Tu., Th., at 10.25.

6. *Dramatic Poets*
Professor Allinson.
Mon., Tu., Th., at 10.25.

10. *The Drama*
Professor Allinson.
Tu., Wed., Sat., at 9.25.

12. *Thucydides*
Professor Manatt.
Tu., Wed., Sat., at 9.25.

9. *Theocritus and Herondas*
Professor Manatt.
Tu., Wed., Sat., at 9.25.

36. *Introduction to Greek Archeology*
Professor King.
Third Term. *Mon., Tu., Th., at 11.25.*

33. *Greek Life*
Professor Manatt.
First Term. *Mon., Th., Fri., at 9.25.*

HISTORY

1. *Mediaeval and Modern History of Europe*
Professor MacDonald.
Mon., Tu., Th., at 11.25.

11, 12, 13. *English Constitutional and Political History since 1689*
Professor Munro.
Mon., Tu., Th., at 11.25.

6. *The French Revolution*
Professor Munro.
Mon., Wed., Fri., at 12.25.

14, 15, 16.† *Seminary in European History*

17. *American History to 1763*
Professor MacDonald.

18. *The American Revolution, 1763–1787*
Professor MacDonald.
Tu., Fri., Sat., at 10.25.

22, 23, 24.† *Seminary in American History*

26. *History of the United States since 1877*
Professor MacDonald.
Mon., Tu., Th., at 11.25.

MATHEMATICS

3. *Algebra*
Professors Manning *and* Slocum.
Mon., Tu., Th., Fri., at 11.25.

1. *Geometry, Solid and Spherical*
Professors Manning *and* Slocum.
Mon., Tu., Th., Fri., at 11.25.

2. *Trigonometry*
Professors Manning *and* Slocum.
Mon., Tu., Th., Fri., at 11.25.

4. *Analytic Geometry*
Professor Davis.
Mon., Wed., Th., at 10.25.

5. *Differential Calculus*
Professor Davis.
Mon., Wed., Th., at 10.25.

6.† *Integral Calculus*

7.† *Applications of the Differential Calculus*

8.† *Applications of the Integral Calculus*

9, 10, 11.† *Differential Equations*

12.† *Determinants and Theory of Equations*

13.† *Modern Methods of Analytic Geometry*

PHILOSOPHY

1. *Logic*
Professor Meiklejohn.
Tu., Wed., Sat., at 9.25.

9, 10. *Theoretical Ethics*
Professor Everett.
Mon., Tu., Th., at 11.25.

12. *Philosophy of Religion*
Professor Everett.
Mon., Tu., Th., at 11.25.

11. *Practical Ethics*
President Faunce.
Tu., Wed., Sat., at 10.25.

EDUCATION

1. *History of Education*
Professor Jacobs.
Mon., Wed., Th., at 10.25.

2. *Critical Study of Modern Education*
Professor JACOBS.
Mon., Wed., Th., at 10.25.

3. *Fundamental Principles of Education*
Professor JACOBS.
Mon., Wed., Th., at 10.25.

4. *Psychology of Education*
Professor JACOBS.
Mon., Th., Fri., at 9.25.

5. *Hygiene of Education*
Professor JACOBS.
Mon., Th., Fri., at 9.25.

6. *Practical Introduction to Teaching*
Professor JACOBS.
Mon., Th., Fri., at 9.25.

PHYSICS

1, 2, 3. *Elementary Physics*
Professor BARUS.
Mon., Tu., Th., at 11.25.

4, 5, 6.† *Elementary Physics, continued*

7.† *Physical Measurements*

14, 15, 16.† *Advanced Laboratory Course*

17, 18, 19.† *Applied Harmonic Analysis*
or
20, 21, 22.† *Advanced Course*

POLITICAL ECONOMY

1. *Elementary*
Dr. KIRK.
Wed., Fri., Sat., at 11.25.

2.* *General Economics*
Dr. Kirk.
Mon., Th., Fri., at 9.25.

4.† *Public Finance*

5.† *History and Present Tendencies of Political Economy*

6.† *The Labor Movement*

7.† *Socialism*

9.† *The Tariff*

10, 11, 12.† *Industrial History*

20, 21, 22.† *Investigation of Special Topics*

ROMAN LITERATURE AND HISTORY

1. *Livy*
Professor King.
Mon., Wed., Th., at 10.25.

2. *Cicero's Letters*
Professor Harkness.
Mon., Wed., Th., at 10.25.

3. *Tacitus's Germania and Agricola*
Professor Greene.
Mon., Wed., Th., at 10.25.

5. *Catullus, Tibullus, and Propertius*
Professor Greene.
Mon., Wed., Th., at 10.25.

34. *Vergil*
Professor King.
Mon., Wed., Th., at 10.25.

6. *Satires of Horace*
Professor Harkness.
Mon., Wed., Th., at 10.25.

10, 11, 12. *Latin Prose Writers*
Professor Harkness.
Tu., Th., Sat., at 12.25.

22, 23, 24.† *Latin Composition*

28, 29. *Roman Life*
Professor Greene.
Mon., Th., Fri., at 9.25.

ROMANCE LANGUAGES AND LITERATURES

1. *Elementary French*
Professor Morse.
Mon., Th., Fri., at 9.25.

2, 3, 4. *Intermediate French Course*
Professors Johnson *and* Morse.
1st div. Tu., Wed., Sat., at 9.25; 2d div. Mon., Wed., Th., at 10.25.

5, 6, 7. *French Language and Literature*
Professor Langdon.
Mon., Th., Fri., at 9.25.

11, 12, 13. *French Literature since 1850*
Professor Johnson.
Tu., Th., Sat., at 12.25.

35, 36, 37. *Dante in English*
Professor Langdon.
Wed., Fri., Sat., at 11.25.

26, 27, 28.† *Modern Italian*

38, 39, 40.† *Modern Spanish*

SOCIAL AND POLITICAL SCIENCE

POLITICAL SCIENCE

1. *Elementary*
Professor Wilson.
Second Term. *Wed., Fri., Sat., at 11.25.*

SOCIAL SCIENCE

1. *Elementary*
Professor Dealey.
First Term. *Wed., Fri., Sat., at 11.25.*

2. *Social Institutions, Conditions, and Problems* §
Professor Dealey.
Tu., Th., Sat., at 12.25.

PHYSICAL TRAINING

Miss Adams

From the first week in November to the end of May, all first and second year students are required to attend gymnasium exercises twice a week as follows:

1st div. Tu., Th., 2.30 to 3.30.
2d div. Tu., Th., 3.30 to 4.30.
Juniors and Seniors will be admitted to these classes.

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§ Any one of the other advanced courses described in Courses of Instruction may be substituted for Social Science 2, if requested by a sufficient number of students.

ANNOUNCEMENT OF COURSES
OFFERED IN
BROWN UNIVERSITY
1906–1907

PROVIDENCE, RHODE ISLAND
PUBLISHED BY THE UNIVERSITY
1906

CALENDAR 1906–1907

Vacations and holidays occurring within the academic year 1906–7 are indicated by dark type.

1906

JULY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
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29	30	31				

AUG.

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OCT.

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NOV.

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23	**24**	**25**	**26**	**27**	**28**	**29**
30	**31**					

1907

JAN.

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MAY

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JUNE

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1907

JULY

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AUG.

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SEPT.

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OCT.

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NOV.

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DEC.

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22	23	24	25	26	27	28
29	30	31				

UNIVERSITY CALENDAR 1906–7

1906	
September 5.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
September 13–17.	*Thursday, Friday, Saturday, and Monday.* Examinations for admission to the Freshman class and to advanced standing.
September 18.	*Tuesday.* Last day for registration and enrolment of Undergraduate Students.
September 19.	*Wednesday.* Academic Year begins. Last day for registration of Graduate Students.
September 29.	*Saturday.* Examination in Greek for the President's Premiums.
October 3.	*Wednesday.* Examination in Latin for the President's Premiums.
October 6.	*Saturday.* Examination in Mathematics for the Hartshorn Premiums.
October 10.	*Wednesday.* Examination in French for the President's Premiums.
Nov. 29–Dec. 1.	*Thursday to Saturday.* Thanksgiving Recess.
December 13–21.	*Thursday to Friday.* Term examinations.
Dec. 22, 1906 to January 2, 1907.	*Saturday to Wednesday.* Christmas Recess.
1907	
January 2.	*Wednesday.* Last day for enrolment of Undergraduate Students.
January 3.	*Thursday.* Second Term begins.
February 22.	*Friday.* Washington's Birthday. No University exercises.
March 12–20.	*Tuesday to Wednesday.* Term examinations.
March 21–27.	*Thursday to Wednesday.* Spring Recess.
March 27.	*Wednesday.* Last day for enrolment of Undergraduate Students.
March 28.	*Thursday.* Third Term begins.

April 1.	*Monday.* Last day for receiving applications for examination for the degree of Doctor of Philosophy, or of Master of Arts *in absentia.*
April 2.	*Tuesday.* Last day for receiving essays submitted in competition for the Gaston Prize Medal.
April 30	*Tuesday.* Last day for receiving theses of candidates for the degree of Doctor of Philosophy.
May 1.	*Wednesday.* Last day for receiving applications for the Grand Army of the Republic Fellowship.
May 7.	*Tuesday.* Carpenter Prize Speaking Contest.
May 14.	*Tuesday.* Gaston Prize Medal Competition.
May 21.	*Tuesday.* Hicks Prize Debate.
May 30.	*Thursday.* Memorial Day. No University exercises.
May 31.	*Friday.* Last day for examinations for advanced degrees.
June 6–14.	*Thursday to Friday.* Term examinations.
June 16.	*Sunday.* Baccalaureate Sermon: First Baptist Meeting House, 4.30 p.m.
June 17.	*Monday.* Class Day.
June 18.	*Tuesday.* Annual Meeting of the Phi Beta Kappa Society: Administration Building, 9.30 a.m. Ivy Day: Pembroke Hall. Annual Meeting of the Associated Alumni: Manning Hall, 2 p.m. Oration before the Phi Beta Kappa Society: Sayles Memorial Hall, 4 p.m.
June 19.	*Wednesday.* One Hundred and Thirty-Ninth Annual Commencement (third Wednesday in June): First Baptist Meeting House, 10.00 a.m.
June 20.	*Thursday.* Meeting of the Corporation.
June 20–24.	*Thursday, Friday, Saturday, and Monday.* Examinations for admission to the Freshman class and to advanced standing.

GENERAL ANNOUNCEMENTS

FOR

THE ACADEMIC YEAR

1906–1907

THE academic year begins with chapel service at 9 a.m., on Wednesday, September 19. At the close of this service the classes will begin their sessions according to the time schedule.

ENTRANCE EXAMINATIONS GIVEN BY THE UNIVERSITY

Examinations for admission to the Freshman class are held in Wilson Hall in June on the Thursday, Friday, Saturday, and Monday next following Commencement, and also in September on the Thursday, Friday, Saturday, and Monday next preceding the beginning of the academic year. Candidates may be examined in all the subjects in June or in September, or in part in June and in the remainder in September. After 1907 Brown University will offer no examinations in June. See the statement below relative to the examinations conducted by the College Entrance Examination Board.

Before taking any examination, the candidate must present to the Registrar a letter of recommendation from the principal of his preparatory school and secure a card admitting him to the examinations. This may be done by correspondence, provided that the written application and the recommendation are received not less than one week before the first examination held.

If a candidate offers subjects in excess of those required for admission, he may be examined in them at the times scheduled below and receive credit for them as college studies.

The order of the examinations in 1906 will be as follows:

THURSDAY, JUNE 21 and SEPTEMBER 13
Algebra, Wilson Hall 27, 8 a.m. to 10 a.m.
Plane Geometry, Wilson Hall 27, 10 a.m. to 12 m.
Elementary French, Wilson Hall 2, 1 p.m. to 3 p.m.
Advanced French, Wilson Hall 2, 4 p.m. to 6 p.m.

FRIDAY, JUNE 22 and SEPTEMBER 14
Elementary Greek, Wilson Hall 2, 8 a.m. to 10 a.m.
Advanced Greek, Wilson Hall 2, 10 a.m. to 11.30 a.m.
Astronomy, Wilson Hall 25, 8 a.m. to 10 a.m.
Physical Geography, Wilson Hall 25, 10 a.m. to 12 m.
Elementary Latin, Wilson Hall 25, 12.30 p.m. to 2.30 p.m.

Advanced Latin, Wilson Hall 25, 2.30 p.m. to 4 p.m.
English and American History, Wilson Hall 27, 4 p.m. to 6 p.m.
Freehand Drawing. Candidates will offer their plates for examination at Wilson Hall 2, at 2 p.m.

SATURDAY, JUNE 23 and SEPTEMBER 15
English, Wilson Hall 26, 8 a.m. to 10 a.m.
Chemistry, Wilson Hall 2, 11 a.m. to 1 p.m.
Solid Geometry, Wilson Hall 27, 2 p.m. to 4 p.m.
Plane Trigonometry, Wilson Hall 27, 4 p.m. to 6 p.m.

MONDAY, JUNE 25 and SEPTEMBER 17
Elementary German, Wilson Hall 2, 8 a.m. to 10 a.m.
Advanced German, Wilson Hall 2, 10 a.m. to 12 m.
Ancient History, Wilson Hall 25, 1 p.m. to 3 p.m.
Physics, Wilson Hall 1, 4 p.m. to 6 p.m.

ENTRANCE EXAMINATIONS GIVEN BY THE COLLEGE ENTRANCE EXAMINATION BOARD

Examinations conducted under the supervision of the College Entrance Examination Board will be accepted in place of the corresponding examinations conducted by Brown University. In 1906 these examinations will be held June 18–23.

All applications for such examinations must be addressed to the Secretary of the College Entrance Examination Board, Post Office Sub-Station 84, New York, and must be made upon a blank form to be obtained from the Secretary of the Board upon application. Applications for examination at points in the United States east of the Mississippi River, also at Minneapolis, St. Louis, and other points on the Mississippi River, must be received by the Secretary of the Board on or before Monday, June 4, 1906; applications for examination elsewhere in the United States or in Canada must be received on or before Monday, May 28, 1906; and applications for examination outside the United States and Canada must be received on or before Monday, May 14, 1906. Applications received later than the dates named will be accepted when it is possible to arrange for the examinations of the candidates concerned, but only upon the payment of $5.00 in addition to the usual examination fee.

The examination fee is $5.00 for all candidates examined at points in the United States and Canada, and $15.00 for all candidates examined outside of the United States and Canada. The fee (which cannot be accepted in advance of the application) should be remitted by postal order, express order, or draft on New York, to the order of the College Entrance Examination Board.

A list of the places at which examinations are to be held by the Board in

June, 1906, may be obtained from the Secretary of the Board. Requests that the examinations be held at particular points, to receive proper consideration, should be transmitted to the Secretary of the Board not later than February 1.

REGISTRATION AND ENROLMENT OF UNDERGRADUATES

REGISTRATION

In September of each year all *new students*, whether candidates for a degree or special students, must report at the Registrar's office between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first term, and fill out registration cards for the ensuing year as a whole. Failure to comply with this rule will be treated as late registration and a fee of three dollars charged. All new students must present at or before the time of registration all credentials necessary for admission either as candidates for a degree or as special students.

In May of each year all *Undergraduates in residence*, whether candidates for a degree or special students, must obtain at the Registrar's office registration cards for the next year; these cards must be filled out by the students themselves with a statement of the courses elected for the whole of the ensuing year, and returned not later than June 1. Failure to comply with this rule will be treated as late registration and a fee of three dollars charged.

Courses bearing a single number must be elected as a whole. When term courses are grouped in one paragraph (*e. g.* Astronomy 1, 2, 3), the second term may not be taken without the first, nor the third without the second, unless specific statement to the contrary is made. In starred courses a final mark covering the work of the course as a whole will be given at the end of the course, the marks given at the end of the preceding term or terms being regarded as temporary. Care should be taken in the election of courses, as changes in registration will be allowed only on presentation of sufficient reasons. Requests for permission to make changes in September must be presented to the Committee on Registration and Attendance between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first term. Requests for permission to make changes for the second or third term must be presented to the Committee before the beginning of the examinations of the first and second terms respectively, unless these requests be the result of failures, in which case they must be presented in writing to the Registrar two days before the opening of the second and third terms respectively.

ENROLMENT

In September all students whose registration cards have been already approved must report at the Registrar's office between 10 a.m. and 12 m. or between 3 p.m. and 5 p.m. on the day preceding the opening of the first term and have their names checked as enrolled for the term. Failure to report will be treated as late enrolment and a fee of three dollars charged.

At the beginning of the second and third terms all Undergraduates must report at the Registrar's office between 10 a.m. and 12 m. or between 3 p.m. and 5 p.m. on the day preceding the opening of the term and have their names checked as enrolled for the term. Failure to report will be treated as late enrolment and a fee of three dollars charged.

GRADUATE STUDENTS

Graduate students will report to the Dean of the Graduate Department in No. 5 Wilson Hall between 9 a.m. and 1 p.m. or between 3 and 5 p.m. on the Monday or Tuesday preceding the opening of the first term.

GUARANTEE

Every student, with the exceptions noted below, must present at or before his registration for the first term of the year the following guarantee, properly signed and witnessed. The guarantor must be the parent or guardian, or some other responsible person.

In consideration of the admission of
as a student in Brown University, I hereby guarantee and promise to pay to said University all dues for rent, tuition, and incidental and other expenses properly chargeable to said as such student, as and when the same shall respectively become payable.

A student paying the full room charges for the year at or before his registration for the first term, and the tuition and other charges for each term at or before his registration for that term, will not be required to present a guarantee.

NOTES

When the time of recitation is not given in connection with the announcement of the courses, the hours will be arranged with the instructors at the beginning of the term.

Members of the Senior Class who are candidates for the degree of Bachelor of Science in Civil Engineering are required to hand the subjects of their theses to the Professor of Civil Engineering on or before October 31, 1906.

Students desiring to rent rooms or to obtain room-mates should apply to the Registrar.

For official notices students should consult the bulletin boards in the north corridor of University Hall or in the Administration Building.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ARTS

I. PRESCRIBED SUBJECTS

A*NCIENT Languages* (either Latin or Greek, or both). Six hours. At least three hours must be taken in the Freshman year, and the whole six hours must be completed by the end of the Sophomore year.

Modern Languages (either French or German, or both). Six hours. At least three hours must be taken in the Freshman year, and the whole six hours must be completed by the end of the Sophomore year.

Students presenting German only must take elementary French. Students presenting French only must take elementary German. Students presenting elementary French only must continue French in the Freshman year and take elementary German in either the Freshman or the Sophomore year. Students presenting elementary German only must continue German in the Freshman year and take elementary French in either the Freshman or the Sophomore year. Students presenting elementary French and elementary German only must continue both languages, but may postpone the continuation of one language to the Sophomore year. Students presenting elementary work in one language and elementary and advanced work in the other must take in the Freshman year the language in which the elementary work only was presented. Students presenting elementary and advanced work in both languages may take the required six hours in either French or German, or both.

Mathematics. Four or five hours. Freshman year. Students not presenting Solid Geometry take Mathematics four hours a week. Students presenting Solid Geometry and Plane Trigonometry take Mathematics five hours a week.

English. Rhetoric and Composition. Three hours. Freshman year.

European History. Three hours. First and second terms, Sophomore or Junior year.

English Literature. Any one of the courses from 10 to 23 inclusive. Sophomore, Junior, or Senior year.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Political Science, Social Science, and Political Economy. One three-hour, one-term course in each of the three departments. Sophomore, Junior, or Senior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year. The courses in Education cannot be taken to satisfy this requirement.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. *Required Studies.*

Latin 1, 2, 3 or *Greek* 1, 2, 3. Three hours.

French 1 or 2, 3, 4 or *German* 1 or 2. } Three hours.

Mathematics 3, 1, 2. Four hours; or

Mathematics 4, 5; 15, 16. Five hours.

English 1. Three hours.

II. *Elective Studies.*

One three-hour course running through the year must be chosen from the following list:

Latin 1, 2, 3. For students presenting elementary and advanced Latin for admission.

Greek A, B, C. For students presenting no Greek for admission.

Greek 1, 2, 3. For students presenting elementary and advanced Greek for admission.

French 1. For students presenting no French for admission.

French 2, 3, 4. For students presenting elementary French for admission.

French 5, 6, 7. For students presenting advanced French for admission.

German 1. For students presenting no German for admission.

German 2. For students presenting elementary German for admission.

German 7. For students presenting advanced German for admission.

Greek 33, *Latin* 28, 29. (*Greek and Roman Life.*) For all students.

Chemistry 1, 2, 3. For all students.

Chemistry 4, 5, 6. For students presenting Chemistry for admission. (Subject to the consent of the department.)

Botany 1 *or Comparative Anatomy* 1. For all students.

SOPHOMORE YEAR

I. That portion of the required work in ancient and modern languages not completed in the Freshman year.

II. Other required and elective courses sufficient with those taken under I to make fifteen hours a week.

JUNIOR YEAR

I. The required History and Physical or Natural Science, if not previously taken.

II. Other required and elective courses sufficient with those taken under I to make fifteen hours a week.

SENIOR YEAR

I. All required courses not previously taken.

II. Elective courses sufficient with those taken under I to make fifteen hours a week.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF PHILOSOPHY

I. PRESCRIBED SUBJECTS

Modern Languages. An amount sufficient with the work presented for admission to complete the elementary course and a year of advanced work in both French and German. A student who is admitted in both advanced French and advanced German is required to continue one of these languages for one year, three hours a week.

Mathematics. Four or five hours. Freshman year. Students not presenting Solid Geometry take Mathematics four hours a week. Students presenting Solid Geometry and Plane Trigonometry take Mathematics five hours a week.

English. Rhetoric and Composition. Three hours. Freshman year.

European History. Three hours. First and second terms, Sophomore or Junior year.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year. The courses in Education cannot be taken to satisfy this requirement.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. *Required Studies.*

English 1. Three hours.

French 1 or 2, 3, 4 or *German* 1 or 2. } Three hours.

Mathematics 3, 1, 2. Four hours; or

Mathematics 4, 5; 15, 16. Five hours.

II. *Elective Studies.*

Two three-hour courses running through the year must be chosen from the following list:

Latin 1, 2, 3. For students presenting elementary and advanced Latin for admission.

Greek A, B, C. For students presenting no Greek for admission.

Greek 1, 2, 3. For students presenting elementary and advanced Greek for admission.

French 1. For students presenting no French for admission.

French 2, 3, 4. For students presenting elementary French for admission.

French 5, 6, 7. For students presenting advanced French for admission.

German 1. For students presenting no German for admission.
German 2. For students presenting elementary German for admission.
German 7. For students presenting advanced German for admission.
Greek 33, *Latin* 28, 29. (*Greek and Roman Life.*) For all students.
Chemistry 1, 2, 3. For all students.
Chemistry 4, 5, 6. For students presenting Chemistry for admission. (Subject to the consent of the department.)
Botany 1 *or Comparative Anatomy* 1. For all students.
Mechanical Drawing 2, 3. For all students.

SOPHOMORE YEAR

I. That portion of the required work in modern languages not completed in the Freshman year.

II. Other required and elective courses sufficient with those taken under I to make fifteen hours a week.

JUNIOR YEAR

I. The required History and Physical or Natural Science, if not previously taken.

II. Other required and elective courses sufficient with those taken under I to make fifteen hours a week.

SENIOR YEAR

I. All required courses not previously taken.

II. Elective courses sufficient with those taken under I to make fifteen hours a week.

REQUIREMENTS

FOR THE DEGREE OF BACHELOR OF SCIENCE IN CIVIL ENGINEERING

First Term	*Second Term*	*Third Term*
	FRESHMAN YEAR	
Mathematics 17	Mathematics 18	Mathematics 19
Mech. Drawing 1	Mech. Drawing 1	Mech. Drawing 1
Civil Engineering 1	Civil Engineering 2	Civil Engineering 3
English 1	English 1	English 1
French 2 or German 2	French 3 or German 2	French 4 or German 2
	SOPHOMORE YEAR	
Mathematics 20	Mathematics 21	Mathematics 21
Civil Engineering 4	Civil Engineering 5	Civil Engineering 6

First Term	*Second Term*	*Third Term*
	SOPHOMORE YEAR	
Physics 1	Physics 2	Physics 3
‡Political Science 1	‡Social Science 1	‡Political Economy 1
	Civil Engineering 7	§Civil Engineering 8
	Civil Engineering 9	Geology 3
Also, of the following courses, the subject not presented for admission:		
Chemistry 1	Chemistry 2	Chemistry 3
French 1	French 1	French 1
German 1	German 1	German 1
	JUNIOR YEAR	
Civil Engineering 10, 11	Civil Engineering 12	Civil Engineering 13
Mechanics 1	Mechanics 1	Mechanics 1
Astronomy 4	Astronomy 5	Astronomy 6
Physics 7	Physics 7	Physics 7
Elect. Engineering 1	Elect. Engineering 2	Civil Engineering 15
	Civil Engineering 14	
	SENIOR YEAR	
Civil Engineering 23	Civil Engineering 24	Civil Engineering 17
Civil Engineering 25	Civil Engineering 29	Civil Engineering 18
Civil Engineering 26	Civil Engineering 27	Civil Engineering 28
Civil Engineering 35	Civil Engineering 35	Civil Engineering 35
Mech. Engineering 22	Mech. Engineering 22	Civil Engineering 19
Mechanics 2	Mechanics 2	Civil Engineering 32
Geology 6	Civil Engineering 30	Civil Engineering 34
	Civil Engineering 31	

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

First Term	*Second Term*	*Third Term*
	FRESHMAN YEAR	
Mathematics 17	Mathematics 18	Mathematics 19
Drawing 1	Drawing 1	Drawing 1
Civil Engineering 1	Civil Engineering 2	Civil Engineering 3
English 1	English 1	English 1
French 2 or German 2	French 3 or German 2	French 4 or German 2

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‡ Or some other course, not technical, chosen with the approval of the head of the Department of Civil Engineering.

§ Civil Engineering 8 is taken during the spring recess.

First Term	*Second Term*	*Third Term*
	SOPHOMORE YEAR	
Mathematics 20	Mathematics 21	Mathematics 21
Mech. Drawing 4	Mech. Drawing 5	Mech. Engineering 8
Physics 1	Physics 2	Physics 3
‡Political Science 1	‡Social Science 1	‡Political Economy 1
	Mech. Engineering 1	Mech. Engineering 2

Also, of the following courses, the subject not presented for admission:

Chemistry 1	Chemistry 2	Chemistry 3
French 1	French 1	French 1
German 1	German 1	German 1
	JUNIOR YEAR	
Mech. Engineering 19	Mech. Engineering 20	Mech. Engineering 21
Mech. Engineering 16	Mech. Engineering 17	Mech. Engineering 18
Mech. Engineering 3	Mech. Engineering 4	
Mech. Engineering 9	Mech. Engineering 10	Mech. Engineering 11
Mechanics 1	Mechanics 1	Mechanics 1
Physics 7	Physics 7	Physics 7
	SENIOR YEAR	
Mech. Engineering 22	Mech. Engineering 22	
Mech. Engineering 5	Mech. Engineering 6	
Mech. Engineering 12	Mech. Engineering 13	Mech. Engineering 14
Mechanics 2	Mechanics 2	Mech. Engineering 15
Elect. Engineering 1	Elect. Engineering 2	Elect. Engineering 3
Mech. Engineering 23	Mech. Engineering 24	Civil Engineering 32
Mech. Engineering 25	Mech. Engineering 25	Mech. Engineering 25

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

First Term	*Second Term*	*Third Term*
	FRESHMAN YEAR	
Mathematics 17	Mathematics 18	Mathematics 19
Mech. Drawing 1	Mech. Drawing 1	Mech. Drawing 1
Civil Engineering 1	Civil Engineering 2	Civil Engineering 3
English 1	English 1	English 1
French 2 or German 2	French 3 or German 2	French 4 or German 2

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‡ Or some other course, not technical, chosen with the approval of the head of the Department of Mechanical Engineering.

First Term	*Second Term*	*Third Term*
	SOPHOMORE YEAR	
Mathematics 20	Mathematics 21	Mathematics 21
Mech. Drawing 4	Mech. Drawing 5	Mech. Engineering 8
Physics 1	Physics 2	Physics 3
‡Political Science 1	‡Social Science 1	‡Political Economy 1
	Mech. Engineering 1	Mech. Engineering 3
Also, of the following courses, the subject not presented for admission:		
Chemistry 1	Chemistry 2	Chemistry 3
French 1	French 1	French 1
German 1	German 1	German 1
	JUNIOR YEAR	
Mechanics 1	Mechanics 1	Mechanics 1
Mech. Engineering 4	Mech. Engineering 5	
Mech. Engineering 9	Mech. Engineering 10	Mech. Engineering 11
Physics 7	Physics 7	Physics 7
Elect. Engineering 1	Elect. Engineering 2	Elect. Engineering 3
Elect. Engineering 7	Elect. Engineering 8	Elect. Engineering 9
	SENIOR YEAR	
Mechanics 2	Mechanics 2	Civil Engineering 17
Mathematics 9	Elect. Engineering 11	Physics 19
Elect. Engineering 4	Elect. Engineering 5	Elect. Engineering 6
Physics 23	Physics 23	Physics 23
Elect. Engineering 10	Elect. Engineering 12	Elect. Engineering 13
		Civil Engineering 32
Elect. Engineering 14	Elect. Engineering 14	Elect. Engineering 14

‡ Or some other course, not technical, chosen with the approval of the Department of Electrical Engineering.

COURSES OF INSTRUCTION

*IN every department courses bearing a single number must be elected as a whole. When term courses are grouped in one paragraph (*e. g. *Astronomy 1, 2, 3), the second term may not be taken without the first, nor the third without the second, unless specific statement to the contrary is made. In starred courses a final mark covering the work of the course as a whole will be given at the end of the course, the marks given at the end of the preceding term or terms being regarded as temporary. When the time of meeting is not announced it will be arranged with the instructor at the beginning of the term.*

I. ART

WILLIAM CAREY POLAND, A.M., LITT. D., *Professor of the History of Art*

1, 2, 3. *History of Art from Antiquity through the Renaissance*

First Term, ancient art; a general course in the history of ancient art, chiefly Greek. Second Term, Roman, early Christian, and Mediaeval art; a study of Roman, Romanesque, and Gothic art, with some notice of Byzantine, Arabian, and Oriental art. Third Term, art of the Renaissance; the fifteenth and sixteenth centuries; the effect on art of the dominant motives of the epoch, the development of art in the different countries of Europe, the great masters and their most significant works. Text-book, lectures, lantern views.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Wed., Th., at 10.20.*

4, 5. *Modern Art*

First Term, the seventeenth and eighteenth centuries. Second Term, the nineteenth century. Text-book, lectures, special assigned topics, lantern views.

Three hours. First and Second Terms. Elective for Juniors, Seniors, and Graduates, who have credit for 3. *Tu., Th., Sat., at 12.20.*

6. *Theory and Criticism of the Fine Arts*

A study of the more important facts and laws of artistic production. Text-book, special assigned topics, illustrated lectures.

Three hours. Third Term. Elective for students who have credit for any course in Art. *Tu., Th., Sat., at 12.20.*

7. *Seminary in Classical Architecture*

Critical study; reading of Vitruvius in Latin; discussion of the principles followed by the Greek and Roman architects, and of the influence of Vitruvius upon the Renaissance.

Three hours. Second and Third Terms. Elective for Graduates.

[8. *Seminary in Greek and Roman Sculpture*]

An archaeological course based on Overbeck's *Schriftquellen.*

Three hours. Through the year. Elective for Graduates who read Greek and Latin. Not offered in 1906–7.

9. *Seminary Study of the Acropolis of Athens*

Critical reading, in the Greek, of Pausanias's account of the Acropolis of Athens; lectures and illustrations.

Three hours. First Term. Elective for Graduates who read Greek and Latin.

10. *Freehand Drawing*

Training of hand and eye by progressive study of models of machine parts, casts of ornamental forms, and still-life objects.

One hour. Two hours of drawing. Through the year. Elective for all students. Given at the Rhode Island School of Design. *Tu., or Th., or Fri., at 2.20.*

11. *Practical Work in Art*

Six hours of drawing or other practical work. To illustrate the principles of delineation, color, and chiaroscuro, and the principles of design in architecture, sculpture, and painting, as exemplified in the historic forms of art.

Three hours. Through the year. Elective for students who have credit for 10, and who have taken or are taking 1, 2, 3. Given at the Rhode Island School of Design. *Tu., Th.,Fri., at 2.20.*

[12. *Seminary in Renaissance Art*]

Critical study of the art of the fifteenth and sixteenth centuries, particularly Italian. A more detailed study of the spiritual conditions, the influences, and the masters, than in 3.

Three hours. Through the year. Elective for Graduates who have credit for 3. Not offered in 1906–7. To be offered in 1907–8.

II. ASTRONOMY

WINSLOW UPTON, A.M., *Professor of Astronomy*
FREDERICK SLOCUM, PH.D., *Assistant Professor of Astronomy*

1, 2, 3. *General Course*

Fundamental conceptions of the science; methods of professional study; present state of our knowledge of the heavenly bodies. Young's *Manual of Astronomy;* lectures and abstracts upon assigned topics. Designed either for purposes of general culture or as a preparation for technical work. *Professor* UPTON.

Three hours. Through the year. Elective for Juniors and Seniors who have credit for Mathematics 3, 1, 2. *Tu., Th., Fri., at 3.20.*

4, 5, 6. *Geodetic Astronomy*

Application of astronomy to geodesy; use of the sextant, transit, and zenith telescope for determining time, latitude, longitude, and azimuth. *Professor* UPTON.

Three hours. Through the year. Required of Engineering students. Elective for Juniors and Seniors who have credit for Mathematics 3, 1, 2. May be taken at the same time as 1, 2, 3. Instrumental observations at the Ladd Observatory. *Mon., Tu., Th., at 2.20.*

7, 8, 9. *Nautical Astronomy*

Principles of navigation; methods of determining the position of a ship at sea; use of sextant, compass, and chart for determining latitude, longitude, bearings, and courses. *Professor* SLOCUM.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for Mathematics 3, 1, 2. May be taken at the same time as 1, 2, 3. Not elective for students who have taken or are taking 4, 5, 6. *Mon., Wed., Th., at 10.20.*

10, 11, 12. *Practical Astronomy*

Advanced study of geodetic applications of astronomy; method of least squares. Doolittle's *Practical Astronomy,* with instrumental observations. *Professor* UPTON.

Three hours. Through the year. Elective for Graduates, and for Undergraduates who have shown special aptitude for instrumental observations.

13, 14, 15. *Special Advanced Work*

Research work arranged to meet the requirements of individual students. *Professor* UPTON.

Three hours. Through the year. Elective for Graduates.

III. BIBLICAL LITERATURE AND HISTORY ‡

HENRY THATCHER FOWLER, PH.D., *Professor of Biblical Literature and History*

FRANCIS GREENLEAF ALLINSON, PH.D., *David Benedict Professor of Classical Philology*

HENRY ENGLANDER, A.B., *Assistant in Biblical Literature and History*

1. *Elementary Hebrew*

Grammar; exercises in writing Hebrew; translation of parts of Genesis and Deuteronomy. *Professor* FOWLER *and Mr.* ENGLANDER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

2. *Historical Hebrew*

Reading of the books of Samuel and Kings with special attention to the acquisition of a vocabulary; review of the elements of Hebrew grammar and study of syntax. *Professor* FOWLER *and Mr.* ENGLANDER.

Three hours. Through the year. Elective for students who have credit for 1.

3. *Hebrew Literature*

Psalm Literature. Critical translation of the lyric poetry of the Old Testament, and investigation of the characteristics and development of Hebrew poetry. In succeeding years corresponding courses in the Wisdom, Legal, and Prophetic literature of the Old Testament will be offered. *Professor* FOWLER.

Three hours. Through the year. Elective for Graduates and approved Undergraduates.

4. *Textual Criticism of the Old Testament*

The principles and method of textual criticism, in connection with the study of one of the shorter prophetical books. *Mr.* ENGLANDER.

Three hours. One Term. Offered if applied for by Graduates.

5. *Biblical Aramaic*

Grammar and reading of the Aramaic portions of the Old Testament. *Mr.* ENGLANDER.

Three hours. One term. Offered if applied for by students who have credit for 1.

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‡ For conditions under which students may receive credit in the Newton Theological Institution for work done in this department, see page 148 of the Catalogue, under Arrangements with Other Institutions.

The first and second terms of History 25 are required of all candidates for the degree of Doctor of Philosophy in Biblical Literature and History.

6. *Elementary Arabic*

Grammar; exercises in writing Arabic; translation of prose selections. *Professor* Fowler.

Two hours. Through the year. Elective for Seniors and Graduates.

7, 8, 9. *Gospels and Epistles*

Characteristics of Hellenistic Greek; translation, and investigation of date, authorship, and thought. First Term, the Johannine writings. Second Term, the Gospel of Mark and the First Epistle of Peter. Third Term, the Gospels of Matthew and Luke. *Professors* Allinson *and* Fowler.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Tu., Th., at 2.20.*

[10, 11, 12. *Acts and Pauline Epistles*]

First Term, Acts. Second Term, Thessalonians and Galatians. Third Term, Corinthians and Romans. *Professors* Allinson *and* Fowler.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. Not offered in 1906–7.

13. *Hebrew and Early Jewish History and Literature*

First Term, early Semitic history, the formative age of Hebrew history, and Hebrew literature before the Monarchy. Second Term, history and literature of the Hebrew Monarchy. Third Term, Jewish history and literature from the Captivity to the Maccabean Revolt. Includes nearly the entire Old Testament history and literature. In connection with 14, gives a comprehensive view of Biblical history and literature. The Biblical books are read in the best English translations; no knowledge of the original languages is required. *Professor* Fowler.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

[14. *Later Jewish and Early Christian History and Literature*]

First Term, the Maccabean and Roman ages of Jewish history and literature. Second Term, the four Gospels and the life of Christ. Third Term, the Acts, Epistles, Apocalypse, and history of the Apostolic age. Includes a large part of the Jewish writings from the second century B.C. to the fall of Jerusalem, and the entire New Testament history and literature, studied in its Jewish setting. In connection with 13, gives a comprehensive view of Biblical history and literature. The books are read in the best English translations; no knowledge of the original languages is required. *Professor* Fowler.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Not offered in 1906–7.

15.* *Biblical Seminary*

Subject for 1906–7: Documentary analysis of the Old Testament historical books. No knowledge of Hebrew is required. *Professor* Fowler.

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors.

IV. BOTANY

James Franklin Collins, Ph.B., *Assistant Professor of Botany*

1. *Introductory Course*

Introductory to all other courses in the department; also designed for those who, without intending to pursue the subject further, desire a general view of biological work and biological theories. Aims to give an introduction to laboratory methods of dissection and experiment and the use of the microscope, to afford a general view of the structure and functions of plants and animals, and to present an outline of the more important biological theories, such as evolution, natural selection, variation, mutation, and heredity. After the first term Botany 1 and Comparative Anatomy 1 are identical and the classes are combined.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. *Mon., Tu., Th., 2.20 to 4.20.*

[2.* *Morphology and Physiology*]

Minute structure and special functions of plant cells and tissues; embryology; glycerin and paraffin technique, etc. The work of the third term can be arranged to meet the more special needs of students intending to take up either medicine or forestry. Certain portions of this course may, with the approval of the instructor, be continued by Juniors, Seniors, and Graduates, in course 6.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for 1, and for approved Graduates. Not offered in 1906–7. To be offered in 1907–8.

3, 4, 5. *Cryptogams*

Structure, development, physiology, embryology, classification, etc. First Term, lower fungi and algae. Second Term, higher fungi and fungal diseases of crops and trees. Third Term, hepatics, mosses, ferns, and their allies. Intended to give a general view of the evolution of the cryptogams and of the life-history of certain types. Special stress is laid upon fungal diseases and upon the methods of investigating and experimenting with little known or unknown diseases. Certain portions of this course may, with the approval of the instructor, be continued by Juniors, Seniors, and Graduates, in course 6.

Three hours. Six hours of attendance. Through the year. Course 3 is elective for Sophomores, Juniors, and Seniors, who have credit for 1, and for approved Graduates. Courses 4 and 5 are each elective for those who have credit for 3. Not to be offered in 1907–8. Alternates with 2. *Mon., Wed., Fri., at 12.20.*

6.* *Investigation*

The problems investigated vary, and the course may therefore be taken two or more years in succession. Students electing this course must, so far as possible, definitely arrange the details of work and the time schedule with the instructor before June 1 of the preceding academic year. Special work upon almost any phase of botany may be chosen if approved by the instructor.

Through the year. One to three hours. Two to six hours of attendance for qualified Juniors and Seniors. Primarily for Graduates, who may, with the approval of the instructor, elect the course for more than three hours.

V. CHEMISTRY

John Howard Appleton, A.M., Sc.D., *Newport-Rogers Professor of Chemistry*

John Emery Bucher, Ph.D., *Associate Professor of Organic Chemistry*

Vahan Simon Babasinian, A.M., *Instructor in Chemistry*

Raymond Davis Cady, A.B., *Assistant in Chemistry*

Richard Owen Dummer, A.M., *Assistant in Chemistry*

1, 2, 3. *Descriptive Chemistry*

Non-metals; metals, their metallurgy, compounds, and practical applications; theoretical chemistry. Lectures with experiments; written exercises; individual laboratory work. *Professor* BUCHER, *Messrs.* BABASINIAN *and* DUMMER.

Three hours. Through the year. Elective for Undergraduates. *1st div. Mon., Th., at 10.20; 2d div. Tu., Fri., at 10.20; 3d div. Wed., Sat., at 11.20.* Laboratory hours to be arranged with the instructor.

4, 5. *Qualitative Analysis*

First Term, properties of the metallic elements; their separation from certain of their compounds. Laboratory work; recitations in qualitative analysis and in chemical philosophy; exercises in stoichiometry. Second Term, the principal non-metals and the acids formed by them; methods of separation and recognition of acids and acid radicles. *Professor* APPLETON *and Mr.* CADY.

Three hours. Six hours of attendance. First and Second Terms. Elective for Juniors who have credit for 1, 2, 3. *1st div. Fri. at 11.20; 2d div. Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

6. *Quantitative Analysis*

Quantitative precipitations and separations of the most important elements and compounds; the principles upon which quantitative apparatus is constructed; chemical philosophy and stoichiometry continued. Chiefly laboratory work. *Professor* APPLETON *and Mr.* CADY.

Three hours. Six hours of attendance. Third Term. Elective for Juniors who have credit for 4, 5. *1st div. Fri. at 11.20; 2d div. Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

7, 8, 9. *Quantitative Analysis, advanced course*

Assaying of metallic ores; analysis of agricultural materials: testing of chemicals used in textile establishments, etc. *Professor* APPLETON *and Mr.* CADY.

Six hours. Twelve hours of attendance. Through the year. Elective for Seniors and Graduates who have credit for 6. Laboratory hours to be arranged with the instructor.

10, 11, 12. *Organic Chemistry*

Preparation and analysis of representative organic compounds. Lectures, recitations, and laboratory work. *Professor* BUCHER *and Mr.* BABASINIAN.

Six hours. Through the year. First and Second Terms, three lectures a week and three laboratory periods a week. Elective for approved Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

13. *Assaying*

Professor Appleton *and Mr.* Cady.

Six hours. Twelve hours of attendance. Third Term. Elective for Seniors and Graduates who have credit for 1–6.

14. *Dyeing of Cotton, Wool, and Silk*

The preparation and use of mordants, dyestuffs, etc. *Professor* Appleton *and Mr.* Cady.

Six hours. Twelve hours of attendance. Third Term. Elective for approved Seniors and Graduates.

15, 16, 17. *Industrial Chemistry*

Lectures and laboratory work. *Professor* Appleton.

Three to six hours. Six to twelve hours of attendance. Through the year. Elective for approved Graduates. Each term may be elected separately.

[18, 19, 20. *Physical Chemistry*]

Lectures and laboratory work. *Professor* Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates. Not offered in 1906–7. To be offered in 1907–8.

21, 22. *Organic Chemistry, advanced course*

Professor Bucher.

Three hours. First and Second Terms. Elective for approved Graduates. Not to be offered in 1907–8. *Tu., Wed., Sat., at 9.20.*

23. *Inorganic Chemistry, advanced course*

Professor Bucher.

Three hours. Third Term. Elective for approved Juniors, Seniors, and Graduates. Not to be offered in 1907–8. *Tu., Wed., Sat., at 9.20.*

24, 25, 26. *Organic Preparations, advanced course*

Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

27, 28, 29. *Inorganic Preparations, advanced course*

Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates, who have credit for 10, 11, 12.

30, 31, 32. *Research Work in Chemistry*
Professor Bucher.

Three hours, or more. Through the year. Elective for Graduates.

33, 34, 35. *Conference on Special Topics in Chemistry*
Professor Bucher.

One hour. Through the year. Elective for approved students.

36, 37, 38. *Conference on Special Topics in Chemistry*
Professor Appleton.

One hour. Through the year. Elective for approved students.

VI. CIVIL ENGINEERING ‡

John Edward Hill, C.E.M., Sc.D., *Professor of Civil Engineering*
Arthur Horace Blanchard, C.E., A.M., *Assistant Professor of Civil Engineering*

1, 2, 3. *Lettering*

Practice in simple lettering as a preparation for work in the drafting room. *Professor* Hill.

One hour. Two hours of drafting. Through the year. Not elective. *1st div. Tu., 2.20 to 4.20; 2d div. Fri., 2.20 to 4.20.* Second Term, *3d div. Wed., 2.20 to 4.20.*

4, 5, 6. *Surveying, elementary course*

Theory and practice of plane surveying; use of tape, compass, level, and transit; adjustments of instruments. Lectures, recitations, field work, and drafting. *Professors* Hill *and* Blanchard, *Mr.* Chandler.

Three hours. One hour of recitation, First and Third Terms, and usually six hours of field work or drafting. Through the year. Elective for students who have credit for Mathematics 3, 1, 2 and for Mechanical Drawing 1 or 2. *Tu., 11.20; Mon., Th., 2.00 to 5.00.*

7. *Topographical Drawing*

Pen and colored topography; hill shading by different methods, contour drawing, topographic map-making, conventional signs for structural materials. *Professor* Blanchard *and Mr.* Chandler.

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‡ All courses in this department except 16 are required of candidates for the degree of Bachelor of Science in Civil Engineering; all except 1, 2, 3, and 32 and 35 are elective for other students.

Three hours. Six hours of drafting. Second Term. Elective for Juniors and Seniors who have credit for Drawing 1 or 2. *Wed., Fri., 2.00 to 5.00.*

8, 9. *Surveying, advanced course*

Topography and hydrography; city surveying; use of stadia, plane table, sextant, and barometer; precise base-line measurements with steel tape. Methods as in 4, 5, 6. *Professors* HILL *and* BLANCHARD, *Mr.* CHANDLER.

Three hours and one hour. Second Term. Course 8 is taken during the spring recess. Elective for students who have credit for 4. *Tu. at 11.20.*

10, 11, 12, 13. *Railroad Engineering*

Theory, location, construction, and economics of railroad engineering. Lectures, recitations, field work, and drafting. First Term, railroad curves and practical problems; actual location of a line about two miles long, map, and estimate of cost. Second Term, railroad track and track work, ties, ballast, rails, frogs, switches, etc.; maintenance of way department; methods of work. Third Term, earthwork and its cost; rock excavation; tunnelling; economics of location. *Professor* HILL *and Mr.* CHANDLER.

Two, four (eight hours of field work), three, and three hours. First, First, Second, and Third Terms. Elective for students who have credit for 6 and 9. First Term, *Fri. 10.20 to 12.20; Wed. 8.00 to 5.00.* Second Term, *Tu., Wed., Fri., at 9.20.* Third Term, *Mon., Wed., Fri., at 10.20.*

14. *Hydraulic Engineering* ‡

Consideration of water supply mainly from a sanitary standpoint. A general course designed to give the chemical and biological aspects of water supply without laboratory work. Lectures, recitations, and seminary work. *Professor* HILL.

Three hours. Second Term. Elective for Juniors and Seniors. *Tu., Wed., Fri., at 10.20.*

15. *Geodesy*

Problems in geodetic surveying, with sufficient theory for a proper understanding of the formulae used. Lectures and computations. *Professor* HILL *and Mr.* CHANDLER.

Three hours. One hour of recitation and five hours of computation. Third Term. Elective for students who have credit for 6 and 9, and Astronomy 5. *Th. at 10.20; Fri., 2.20 to 5.20; Sat. 9.20 to 11.20.*

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‡ Courses 14, 17, and 18 cover the general subject of sanitation.

16. *Municipal Improvements*

Economic and social aspects of sewerage, water works, pavements, etc. *Professor* Hill.

Three hours. First Term. Elective for Juniors and Seniors. Offered only if ten or more elect the course.

17. *Hydraulic Engineering* ‡

Supplements Mechanics 2, which gives the theoretical treatment of the subject. Consideration of water supply mainly from an engineering standpoint. Irrigation, pumps, and pumping machinery; construction of dams and reservoirs. Lectures, recitations, and seminary work. *Professor* Hill.

Three hours. Third Term. Elective for students who have credit for Mathematics 6, Mechanics 2, and Drawing 1. *Mon., Wed., Fri., at 9.20.*

18. *Sanitary Engineering* ‡

Sewerage and house drainage; theory of sewerage, with occasional problems in design; treatment and disposal of sewage; stream pollution; appliances used in construction and maintenance; amount and velocity of flow; house drainage and its appliances; garbage collection and disposal. Lectures, recitations, and seminary work. *Professor* Hill.

Three hours. Third Term. Elective for students who have credit for Mathematics 6, Mechanics 2, and Drawing 1. *Mon., Wed., Fri., at 11.20.*

19. *Highway Engineering*

Economics and location of country roads; surveys, grades, drainage, and foundations; construction of roads of earth, gravel, and broken stone; economics and design of street pavements of asphalt, brick, cobble-stone, stone-block, and wood-block; methods of testing road materials; roads and pavements in foreign countries. *Professor* Blanchard.

Three hours. Third Term. Elective for Sophomores, Juniors, and Seniors. *Mon., Tu., Th., at 8.*

[20, 21, 22. *Laboratory Investigations*] §

Use and adjustment of instruments; testing materials; stereotomy. *Professor* Hill.

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‡ Courses 14, 17, and 18 cover the general subject of sanitation.

§ In 1906–7 students in Civil Engineering will take Mechanical Engineering 22 in place of Civil Engineering 20 and 21.

Three hours. Through the year. Elective for students who have credit for Mathematics 6, Mechanics 1, and Drawing 1. Not offered in 1906–7.

23. *Simple Framed Structures*

The standard forms of simple roof trusses; calculation by analytical methods of stresses due to dead, snow, and wind loads; calculation by analytical methods of stresses in Pratt, Howe, Warren, and parabolic trusses due to dead, wind, uniform live, excess panel live, and locomotive wheel loads; miscellaneous trusses, skew bridges, influence lines, cranes, trussed bents, and towers. Lectures, recitations, and seminary work. *Professor* BLANCHARD.

Three hours. First Term. Elective for students who have credit for Mathematics 6, Mechanics 1, and Drawing 1 or 2. *Mon., Tu., Th., at 9.20.*

24. *Higher Framed Structures*

Continuous bridges; theorem of three moments; swing bridges; calculation of stresses in continuous and non-continuous center-bearing swing bridges; draw-span machinery; cantilever bridges and suspension bridges; general analysis of three-hinged, two-hinged, and fixed-end arches. Lectures, recitations, and seminary work. *Professor* BLANCHARD.

Two hours. Second Term. Elective for students who have credit for 23. *Mon., Th., at 8.*

25. *Structural Details*

Riveted joints, roof details, tension members, combined direct and bending stresses, secondary stresses, columns under direct and eccentric loading; details of wooden structures, plate girder, parabolic highway, pin-connected, and riveted Pratt truss railroad bridges; construction of viaducts and elevated railroads; steel mill-building and high building construction; comparison of standard structural specifications. Lectures and computations. *Professor* BLANCHARD.

Three hours. First Term. Elective for students who have taken or are taking 23. *Mon., Tu., Th., at 8.*

26. *Roof Design and Graphic Statics*

Graphic determination of center of gravity and moment of inertia of combinations of structural shapes; determination by graphical methods of stresses in simple roof trusses; moment and shear diagrams for the determination of stresses in plate girder bridges, Pratt trusses, and bridge trusses with inclined chords; complete design, with shop drawings, of a fifty to seventy foot roof truss; revision and discussion of checked drawings; drawing and computations; inspection trips. *Professor* Blanchard *and Mr.* Chandler.

Three hours. One hour of recitation and four hours of drafting. First term. Elective for students who are taking 23 and 25. *Tu. at 10.20; Mon., Th., 10.20 to 12.20; Wed. 2 to 5.*

27, 28. *Bridge Design*

Detail design, with shop drawings, of a heavy plate girder railroad bridge; general design, with shop drawings, of a two hundred foot parabolic highway bridge; general class design of a wooden trestle. Lectures on American and English shop practice, the esthetic design of bridges, design of stand pipes and elevated tanks, and American methods of erection of bridges and structures. Drawing, computations, field excursions, and seminary work or lectures. *Professor* Blanchard *and Mr.* Chandler.

Four and three hours. Eight and six hours of drafting. Second and Third Terms. Elective for students who have credit for 23, 25, 26. Second Term, *Th. 10.20 to 12.20; Tu., Th., 1.20 to 4.20.* Third Term, *Tu. 10.20 to 12.20 and 1.20 to 4.20; Th. at 10.20.*

29. *Reinforced Concrete Structures*

Properties of reinforced concrete; theory and design of reinforced concrete structures; systems of reinforcement; methods of construction. *Professor* Blanchard.

One hour. Second Term. Elective for students who have credit for 23 and 25 and are taking 30. *Mon. at 9.20.*

30. *Masonry Structures*

Static and elastic theory of the masonry arch; design of a stone arch; theory and design of masonry piers, of retaining walls, and of earth and high masonry dams; design of a reinforced concrete arch. *Professor* Blanchard *and Mr.* Chandler.

Three hours. One hour of recitation and four hours of drafting. Second Term. Elective for students who are taking 29. *Tu. at 8; Mon., Tu., 10.20 to 12.20.*

31. *Foundations*

Soundings and borings, foundation-beds, deposition of concrete under water, timber foundations, coffer dams, open caissons, Cushing cylinder piers, pile formulae, driving and foundations, pneumatic caissons of wood and steel, open dredging, the Poetsch freezing process, foundations in quicksand, foundations for high buildings. *Professor* BLANCHARD.

Two hours. Second Term. Elective for students who have credit for 23 and 25. *Tu., Th., at 9.20.*

32. *Engineering Jurisprudence*

Essential elements of a contract, the parties to a contract, considerations, bids and bidders, work for private parties and public work. Employment of engineers, liability of the engineer as a professional man; when his functions are judicial; when he is a public officer. Real property, water rights, ownership, rights of way, boundaries, incorporeal rights, and franchises. Engineering specifications and accompanying documents. *Professor* BLANCHARD.

Two hours. Third Term. Required of candidates for the degree of Bachelor of Science. *Tu., Th., at 9.20.*

34. *Design of Sanitary Works*

Practical applications of the principles of design discussed in courses 17 and 18. *Professor* HILL.

One hour. Third Term. Elective for students who have taken or are taking 17 and 18. *Th. at 11.20.*

35. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Civil Engineering. The thesis must embody either a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

VII. COMPARATIVE ANATOMY

ALBERT DAVIS MEAD, PH.D., *Professor of Comparative Anatomy*
FREDERIC POOLE GORHAM, A.M., *Associate Professor of Biology*
LEONARD WORCESTER WILLIAMS, PH.D., *Assistant Professor of Comparative Anatomy*
MICHAEL XAVIER SULLIVAN, PH.D., *Instructor in Physiology*
FRANK TAYLOR FULTON, Sc.B., M.D., *Instructor in Pathology and Histology*
JAY PERKINS, M.D., *Demonstrator in Anatomy*
JOHN COMBE PEGRAM, A.B., M.D., *Demonstrator in Anatomy*

1. *Introductory Course*

Introductory to all other courses in the department; also designed for those who, without intending to pursue the subject further, desire a general view of biological work and biological theories. Aims to give an introduction to laboratory methods of dissection and experiment and the use of the microscope, to afford a general view of the structure and functions of animals and plants, and to present an outline of the more important biological theories, such as evolution, natural selection, variation, mutation, and heredity. After the first term Comparative Anatomy 1 and Botany 1 are identical and the classes are combined. *Professor* GORHAM.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. *Mon., Tu., Th., 2.20 to 4.20.*

2. *Anatomy*

Includes the study of each organ from its primitive form in the lowest animals to its most complex form in the higher animals and in man. Aims to give a thorough knowledge of the structure and meaning of each organ of the animal body. Designed for students of Biology and of Medicine. Students are permitted to attend clinics and autopsies at the Rhode Island Hospital. Laboratory work, lectures, and text-book. *Professor* WILLIAMS.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1, 20, or 21.

3. *Bacteriology*

Preparation and microscopic study of bacteria; the preparation of culture media; isolation, systematic study, and determination of unknown species; qualitative and quantitative biological examination of water, milk, air, and soil; methods of determining pathogenic properties of bacteria; methods of sterilization and disinfection; special work on pathogenic forms. *Professor* GORHAM.

Three hours. Six hours of attendance. Third Term. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon., Wed., Th., at 10.20.*

4. *Histology*

The structure of different kinds of tissues of the body, and the relation of structure to physiological activity; epithelium, nervous and reproductive tissue, glands, bone, cartilage, fat, fibrous tissues; training in the technic of fixing, sectioning, and staining by various approved methods. *Professor* WILLIAMS.

Three hours. Six hours of attendance. First Term. Elective for Juniors and Seniors who have credit for 1, and for Sophomores who have credit for 1 and who are not taking any other course in the department.

5. *Advanced Histology*

Chiefly morphological study of the blood, the skin and its appendages, the gastro-intestinal tract, the circulatory system, and the muscles of man; relation of diseases to structural changes in the cells and tissues. *Dr.* FULTON.

Three hours. Six hours of attendance. Second Term. Elective for Juniors and Seniors who have credit for 4, and for Sophomores who have credit for 4 and who are not taking any other course in the department.

7. *Chemical Physiology*

The chemistry of the proteids, carbohydrates, and fats; of salivary, gastric, and pancreatic digestion; of the blood, bile, and urine; the analysis of milk; toxicology. *Dr.* SULLIVAN.

Three hours. Six hours of attendance. First and Second Terms. Elective for Juniors and Seniors who have credit for Chemistry 2. *Tu., Fri., Sat., at 10.20.*

8. *Physical Physiology*

The physiology of muscle and nerve; the physics and physiology of the circulatory, respiratory, and alimentary systems; the causes and theories of sleep; the physiology of the special senses. *Dr.* SULLIVAN.

Three hours. Six hours of attendance. Third Term. Elective for Juniors and Seniors who have credit for 7. *Tu., Fri., Sat., at 10.20.*

9. *Anatomy of the Nervous System*

The gross anatomy and the microscopic structure of the nervous system in vertebrates, especially in man; phylogeny, embryology, and physiology of the nervous system, and special nerve methods in micro-technic. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1. Not to be offered in 1907–8.

[10. *Comparative Embryology*]

Laboratory work. Principles of embryological development and of heredity, illustrated by the fertilization and cleavage of the egg, metamorphosis, and organ formation. Special attention given to the origin and development of the human body. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1. Not offered in 1906–7. To be offered in 1907–8.

11. *Biological Theories and Biological Problems*

Seminary course. *Professor* MEAD.

One to three hours. Once a week through the year. Elective for Graduates.

12. *Bacteriology, advanced course*

Laboratory work and seminary. *Professor* GORHAM.

Three to twelve hours. Through the year. Elective for Graduates.

13. *Physiology, advanced course*

Laboratory work and seminary. *Dr.* SULLIVAN.

Three to twelve hours. Through the year. Elective for Graduates who have sufficient knowledge of chemistry and physiology.

14. *Human Anatomy*

Laboratory instruction. A course in practical dissection. Students will also have an opportunity to attend certain operations at the hospital and to be present at autopsies. *Dr.* PERKINS *and Dr.* PEGRAM.

Three hours. Through the year. Elective for Graduates.

15. *Special Advanced Work*

Research work arranged to meet the requirements of individual students. *Professor* MEAD.

Three to twelve hours. Through the year. Elective for Graduates.

[16. *General Biology*]

Designed to give a general view of the whole field of biology: the history of biology, principles of classification, geographical distribution, and problems of evolution such as heredity, natural selection, variation, Mendelism, and the general structural relations of man to the lower animals. Lectures and assigned reading. *Professor* MEAD.

Three hours. Third Term. Elective for Juniors and Seniors. Not offered in 1906–7. To be offered in 1907–8.

17. *General Physiology and Hygiene*

The principles of general physiology and their application to personal and municipal hygiene. Lectures and assigned reading. *Dr.* SULLIVAN.

Three hours. Third Term. Elective for Juniors and Seniors. *Mon., Wed., Th., at 10.20.* Not to be offered in 1907–8.

VIII. ENGLISH LITERATURE AND LANGUAGE ‡

WALTER COCHRANE BRONSON, A.M., LITT.D., *Professor of English Literature*

LINDSAY TODD DAMON,† A.B., *Professor of Rhetoric*

ALBERT KNIGHT POTTER, A.M., *Associate Professor of the English Language*

GEORGE WYLLYS BENEDICT, PH.D., *Assistant Professor of English*

THOMAS CROSBY, A.M., *Assistant Professor of English and Public Speaking*

HENRY BARRETT HUNTINGTON, A.B., *Assistant Professor of English*

GEORGE WARRINGTON LATHAM, A.B., *Instructor in English*

WALTER CLARKE PHILLIPS, A.M., *Instructor in English*

HOWARD BRISTOL GROSE, JR., PH.B., *Instructor in English*

GEORGE RUPERT MACMINN, A.B., *Assistant in English*

——————————, *Assistant in English*

1.* *Rhetoric and Composition*

Lectures and recitations upon the fundamental laws of style, with special emphasis upon usage; prescribed reading and themes. Designed to give the student a clear and correct style and some critical standards. *Professors* BENEDICT *and* HUNTINGTON, *Messrs.* LATHAM, PHILLIPS, GROSE, MACMINN, *and* ——.

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‡ Credit for English 1 is a prerequisite for admission to all other courses in English. The requirement in English Literature for the degree of Bachelor of Arts may be satisfied by taking any one of the courses from 10 to 23 inclusive.

† On leave of absence during the academic year 1906–7.

Three hours. Through the year. Required of all Freshmen. *1st, 2d, and 3d div. Fri. at 2.20; Mon., Th., at 11.20. 4th, 5th, and 6th div. Fri. at 2.20; Mon., Wed., at 12.20.*

2.* *English Composition, second course*

Lectures, recitations, and prescribed reading; fortnightly themes and other written exercises. Intended to supplement the training given in 1, and to develop further the power of exact and lucid statement. *Mr.* LATHAM.

Three hours. Through the year. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

[3.* *English Composition, advanced course*]

Frequent practice in composition and criticism. Intended to develop ease and flexibility of style and clarity and vigor of thought. *Professor* DAMON.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores who have attained the grade of C in 1. With the consent of the instructor the course may be repeated. Not offered in 1906–7.

4.* *Argumentative Composition*

Lectures on the principles and forms of argumentative composition; frequent practice in brief-drawing and the writing of forensics and less formal arguments. Intended to develop the power of handling argumentative topics cogently and persuasively. *Professor* HUNTINGTON.

Three hours. Through the year. Elective for Juniors and Seniors. *Mon., Wed., Th., at 10.20.*

5. *Argumentative Composition*

The principles and forms of brief-drawing and forensic writing. Lectures, written exercises, briefs, and forensics. Intended to furnish a more rapid training than 4, for students who wish to begin debate as early as possible or to go quickly over the fundamentals of argumentative composition. *Professor* HUNTINGTON.

Three hours. First Term. Elective for Juniors and Seniors. Not elective for students who have taken 4 or the course formerly known as 4, 5, 6. *Mon. at 3.20; Fri. at 2.20.*

6.* *Debate*

Intended to train students in correct and vigorous oral presentation of ideas. *Professor* HUNTINGTON, *with the coöperation of the Professors of Political Economy, Social and Political Science, History, and Public Speaking.*

Three hours. Second and Third Terms. Elective for a limited number of Juniors and Seniors who have credit for 5 or for one or more terms of 4. With the consent of the instructor, the course may be repeated. *Mon. 3.20 to 5.20; Fri. 2.20 to 4.20.*

7.* *Public Speaking*

Principles of voice culture; vocal interpretation of literature; extempore speaking. *Professor* CROSBY.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Wed., Fri., Sat., at 11.20.*

[8. *Public Speaking, advanced course*]

Reading the Bible, liturgy, and hymns. *Professor* CROSBY.

One hour. Two hours of class-room work. First Term. Elective for a limited number of Seniors. Not offered in 1906–7.

24. *Public Speaking, advanced course*

The occasional address. Practice in the composition and delivery of the more common forms of public discourse, with some attention to voice culture. *Professor* CROSBY.

Three hours. Through the year. Elective for a limited number of Juniors and Seniors who have credit for 7. Not to be offered in 1907–8.

9.* *Old English*

Essentials of Anglo-Saxon grammar; prose selections; Béowulf. *Professor* POTTER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 3.20.*

10.* *Chaucer*

Sufficient study of the language to enable the student to read Middle English intelligently; the more important poems of Chaucer; selections from Langland and Gower; Chaucer in literary history. *Professor* BENEDICT.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 4.20.*

11. *English Literature from the Beginning to the Present Time*

An outline course in the history of English literature, with reading and study of the greater writers. *Professor* Bronson.

Three hours. Through the year. Elective for Sophomores. *Tu., Th., Sat., at 12.20.*

[12. *English Literature, exclusive of the Drama, from 1400 to 1600*]

Mediaeval literary forms and the transition to the modern period: romance, ballad, allegory, satire, Elizabethan novels and lyrics. *Professor* Benedict.

Three hours. Through the year. Elective for students who have credit for 10 and one other of the courses from 9 to 23 inclusive. Not offered in 1906–7.

[13. *History of the Drama in England*]

The drama as a literary type, and its history in England to 1642. *Professor* Potter.

Three hours. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. Not offered in 1906–7.

14. *Shakspere*

Careful study of a few plays, with special attention to exact interpretation. *Professor* Potter.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Not to be offered in 1907–8. *Mon., Wed., Th., at 10.20.*

15. *Shakspere*

Shakspere as dramatist and poet; reading of all the plays. *Professor* Potter.

Three hours. Through the year. Elective for Juniors and Seniors. *Tu., Th., Sat., at 12.20.*

[16. *English Literature, exclusive of the Drama, from 1600 to 1660*]

The decline of the Elizabethan spirit; Puritanism and Anglicanism in literature; the "metaphysical" and mystical poets; the cavalier lyrists; all the English poems and the more important prose works of Milton. *Professor* Bronson.

Three hours. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. Not offered in 1906–7.

17. *English Literature from 1660 to 1798*

The Restoration drama; the classical school; development of the essay and the novel; the beginnings of romanticism. *Professor* Bronson.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. Not to be offered in 1907–8. *Mon., Wed., Fri., at 12.20.*

19. *English Literature from 1798 to 1832*

The romantic revolt in its critical and imaginative phases; influence of the French revolution; individualism in form and spirit. *Professor* Benedict.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon., Wed., Th., at 10.20.*

20. *English Literature from 1832 to 1892*

The Victorian period; modifications of romanticism in prose and poetry; realism; influence of science and democracy; tendencies at the end of the century. *Mr.* Latham.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for Sophomores, Juniors, and Seniors. *Wed., Fri., Sat., at 11.20.*

[21. *Victorian Poets*]

A detailed study of Tennyson, Browning, Arnold, Clough, Rossetti, Morris, and Swinburne. *Professor* Crosby.

Three hours. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. Not offered in 1906–7.

[22. *American Literature*]

American literature from the beginning, in its relation to American life and to English literature. *Professor* Bronson.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for one of the following courses: 11, 19, 20. Not offered in 1906–7.

23. *Seminary in English Literature*

Subject for 1906–7: Studies in the history of English satire. *Professor* Bronson.

Three hours. Two hours of attendance. Through the year. Elective for Graduates, and for a limited number of Seniors who have attained the grade of C in two of the courses from 9 to 22 inclusive.

IX. GEOLOGY ‡

CHARLES WILSON BROWN, A.M., *Instructor in Geology*

3. *Mineralogy and Lithology*

Determination of the common rock-forming minerals and the simpler types of rock; origin, weathering, and metamorphism of rocks and minerals; building stones. Lectures and laboratory work.

Three hours. First term. Elective for Sophomores, Juniors, and Seniors. This course may be taken alone, or may be continued in 6 and 7, in 1, 2, and in 4, 5, for which courses it is a prerequisite. *Tu. at 11.20; Tu., Fri., 2.20 to 4.20.*

6. *Dynamical and Structural Geology*

A discussion of the surface and deep-seated agencies that have affected the formation and development of the earth and its crust. Lectures, illustrated by models and lantern views.

Three hours. Second Term. Elective for Sophomores who do not elect 1, and for Juniors and Seniors. Course 3 is a prerequisite. *Mon., Tu., Th., at 11.20.*

7. *Physiographical and Historical Geology*

A study of certain land-forms and the stages of their development; a review of earth changes, with special reference to the development of the North American continent; the types of life characteristic of the different periods, and the principles of organic evolution which they illustrate. Lectures and three field trips.

Three hours. Third Term. Elective for Sophomores who do not elect 2, and for Juniors and Seniors. Course 3 is a prerequisite. *Mon., Tu., Th., at 11.20.*

1, 2. *Mineralogy*

Crystallography. The more common minerals; their recognition and determination; their occurrence in rocks; the physical properties of minerals; blowpipe analysis. Lectures and laboratory work.

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‡ Students who wish only a general knowledge of minerals and rocks and a general view of the geologic processes concerned in the development of the earth and its life, should take courses 3, 6, and 7. Those who contemplate teaching physical geography should take also courses 10, 12, and 15. Students who desire to specialize in geology or geography, in order to teach or to obtain appointment on Government or State Geological Surveys, are advised to elect first the work in mineralogy, courses 3 and 1, 2, and to follow these by courses 6, 7, 4, 5, 10, 12, and 15, approximately in the order given.

Three hours. Second and Third Terms. Elective for Sophomores who do not elect 6 and 7, and for Juniors and Seniors. Course 3 is a prerequisite. *Wed. at 9.20; Th. 2.20 to 4.20;* two laboratory hours to be arranged with the instructor.

4, 5. *Petrography*

A study of the optical properties of minerals; determination of minerals and rocks by means of the petrographic microscope; a discussion of the fundamental principles of the origin and classification of rocks. Lectures and laboratory work.

Three hours. Second and Third Terms. Elective for Juniors, Seniors, and Graduates. Students intending to take this course are advised to take Physics 5, in preparation. Course 3 is a prerequisite. *Mon. at 10.20; Th., Fri., 2.20 to 4.20.*

9, 8, 11. *Field Geology*

Geological maps, their use and methods of construction; practice in the actual working out of the surface geology and stratigraphy of an assigned definite area. Reports and thesis.

Three hours. Through the year. One conference hour to be arranged with the instructor and the equivalent of six hours' work in the field-area. Elective for Juniors, Seniors, and Graduates. The First Term may be taken independently and is elective for students who have credit for 3, 6, and 7; the First and Second Terms may be elected as a two-term course; the Third Term may be elected separately by students who are taking 7.

17. *Mineralogy and Lithology*

Determination of the common rock-forming minerals and the simpler types of rocks; building stones, their distribution, weathering qualities, and methods of preservation.

Three hours. Third Term. Two hours of lectures and two hours of laboratory work. Required in the Sophomore year of candidates for the degree of Bachelor of Science in Civil Engineering. *Tu., Th., at 10.20; Tu. 2.20 to 4.20.*

16. *Engineering Geology*

Lectures, laboratory and field work. Five field trips are taken in conjunction with the course and each student is required to take detailed field notes of the regions visited.

Three hours. First Term. Required in the Senior year of candidates for the degree of Bachelor of Science in Civil Engineering. *Mon., Wed., Th., at 10.20.*

10, 12, 15. *Physiography*

The ocean; the atmosphere; land forms, their classification, origin, growth, decay, and geographical distribution. With special reference to the influence of physiography upon the economic development of the United States. Lectures and laboratory work.

Three hours. Through the year. Elective for Juniors and Seniors. First Term, *Wed., Fri., at 11.20; Th., 2.20 to 4.20.* Second and Third Terms, *Wed., Fri., at 11.20; Fri. 2.20 to 4.20.*

13. *Physiographic Seminary*

Through the year. Elective for Graduates and others who have had sufficient preliminary training in Physiography.

14. *Geologic Investigation*

Research work in the field and laboratory arranged to meet the needs of individual students.

Through the year. Elective for graduates.

X. GERMANIC LANGUAGES AND LITERATURES

CAMILLO VON KLENZE, PH.D., *Professor of the Germanic Languages and Literatures*

ASA CLINTON CROWELL, PH.D., *Associate Professor of the Germanic Languages and Literatures*

JOHANNES BENONI EDUARD JONAS, PH.D., *Assistant Professor of the Germanic Languages and Literatures*

CLARENCE ELNATHAN NORRIS, A.M., *Instructor in German*

1. *Introductory Course*

Reading, grammar, composition, dictation, sight reading; selections in prose and poetry from standard authors. *Professors* VON KLENZE *and* CROWELL, *Mr.* NORRIS.

Three hours. Through the year. Required of all students not presenting German for admission. *1st and 2d div. Tu., Wed., Sat., at 9.20; 3d div. Mon., Th., Fri., at 9.20; 4th div. Mon., Tu., Th., at 11.20; 5th div. Tu., Th., Sat., at 12.20.*

2. *Intermediate Course*

Selected works of classical and modern authors; study of syntax based upon the text. *Professor* JONAS *and Mr.* NORRIS.

Three hours. Through the year. Required of all Freshmen who presented elementary German for admission. Not elective for students who have taken German in college. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Fri., Sat., at 10.20.*

3, 4, 5. *Drama of the Classic Period*

Lessing, Schiller, Goethe; two dramas of each author. Study of language and literature. The three courses are designed as an introduction to the more advanced courses in German. *Professors* CROWELL *and* JONAS.

Three hours. Through the year. Elective for students who have credit for 1. Each term may be elected independently. *1st div. Mon., Wed., Th., at 10.20; 2d div. Wed., Fri., Sat., at 11.20.*

6. *Modern Prose*

Selections from the best nineteenth century authors. Special attention to sight reading; valuable for students using German sources in other subjects. *Professor* JONAS.

Three hours. Through the year. Elective for students who have credit for 1 or 2. Not open to students who have taken 10 or 11. *Tu., Fri., Sat., at 10.20.*

7. *Advanced Course in Standard Authors*

Selections; chiefly prose and drama. *Professor* JONAS.

Three hours. Through the year. Elective for students who have credit for 2, and for students who presented advanced German for admission. *Mon., Tu., Th., at 11.20.*

8. *Composition*

A continuation of the grammatical work of 1; practice in writing German. Most appropriately taken in connection with 3, 4, 5, or 6. *Professor* VON KLENZE.

One hour. Through the year. Elective for students who have taken or are taking 2; 3, 4, 5; 6 or 7. *Wed. at 11.20.*

10. *German Masterpieces I*

Goethe's *Faust* (Parts 1 and 2), with some notice of recent dramas of kindred interest; in connection with 11 it presents those works of the great German writers which deal with important psychological and moral problems. *Professor* CROWELL.

Three hours. Through the year. Elective for students who have credit for 3, 4, 5, or for 7. Not to be offered in 1907-8. *Mon., Th., Fri., at 9.20.*

[11. *German Masterpieces II*]

Wolfram von Eschenbach's *Parzival,* Schiller's *Wallenstein,* Lessing's *Nathan der Weise. Professor* Crowell.

Three hours. Through the year. Elective for students who have credit for 3, 4, 5, or for 7. Not offered in 1906–7. To be offered in 1907–8.

12, 13, 14. *German Literature*

A four-years' course in literature covering the principal literary movements in Germany from the earliest times to the present. Lectures; reports on assigned topics; extended reading. Subject for 1906–7: Outline of German Literature (in German). *Professor* von Klenze.

Three hours. Through the year. Elective for students who have credit for 7, 10, or 11. *Tu., Th., Sat., at 12.20.*

15. *Middle High German*

The language of the Middle High German period, including an introduction to Germanic Philology. Michel's *Mittelhochdeutsches Elementarbuch; Das Nibelungenlied. Professor* von Klenze.

Three hours. Through the year. Elective for students who have credit for 10, 11, or 14. *Tu., Th., Fri., at 3.20.*

[16. *Old High German*]

Braune's *Althochdeutsche Grammatik* and *Althochdeutsches Lesebuch. Professor* Jonas.

Two hours. Through the year. Elective for Graduates. Not offered in 1906–7. To be offered in 1907–8.

[17. *Germanic Mythology*]

Primitive Germanic religion, customs, and ideas, in their relations to German literature. Discussions based on E. Mogk's *Germanische Mythologie. Professor* Crowell.

One hour. Through the year. Elective for Juniors, Seniors, and Graduates. Not offered in 1906–7. To be offered in 1907–8.

[18. *Germanic Philology*]‡

One hour. Through the year. Elective for Graduates. Not offered in 1906–7.

[19. *German Poetry*]

Comparative study of representative poems. First Term, epics. Second Term, ballads. Third Term, lyrics. *Professor* Jonas.

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‡ In 1906–7 course 15 presents an introduction to Germanic Philology.

Three hours. Through the year. Elective for students who have credit for 10 or 11. Not offered in 1906–7.

[20. *Old Norse*]

Holthausen's *Altisländisches Elementarbuch;* Wilken's *Prosaische Edda; Die Lieder der Edda,* edited by Sijmons and Gering. *Professor* CROWELL.

Two hours. Through the year. Elective for Graduates. Students electing Old Norse should also take Germanic Mythology. Not offered in 1906–7. To be offered in 1907–8.

21. *Gothic*

The Gothic language with reading of extracts in Streitberg's *Gotisches Elementarbuch* or Braune's *Gotische Grammatik. Professor* CROWELL.

Two hours. Through the year. Elective for Graduates. Students electing Gothic should also take Germanic Philology. *Mon. at 3.20; Th. at 4.20.*

22. *Grillparzer and Hebbel*

Study of the representative dramas of each author and the problems they present. *Professor* CROWELL.

One hour. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon. at 4.20.*

XI. GREEK LITERATURE AND HISTORY‡

JAMES IRVING MANATT, PH.D., LL.D., *Professor of Greek Literature and History*

FRANCIS GREENLEAF ALLINSON, PH.D., *David Benedict Professor of Classical Philology*

LIDA SHAW KING, A.M., *Assistant Professor of Classical Philology*

——————————, *Instructor in Greek*

A, B, C. *Elementary Course*

Aims to cover as much as possible of the entrance requirements in Greek. A student will be able to take 1, 2, and 3 in the following year if he completes by private study before the opening of the First Term the entire requirement in the *Anabasis,* and before the opening of the Third Term the entire requirement in Homer. *Mr.* ——

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‡ Courses 1, 2, 3 are a prerequisite for the more advanced courses in this department.

Three hours. Through the year. Elective for students who have not taken Greek before entering college. *Tu., Th., Sat., at 12.20.*

1. *Lysias*

Reading of select orations; practice in sight reading. *Professors* MANATT *and* ALLINSON.

Three hours. First term. Elective for students who presented elementary and advanced Greek for admission, or who have credit for Greek A, B, C and have done the additional work indicated above. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Tu., Th., Sat., at 12.20.*

2. *Plato*

Plato's *Apology* and *Crito,* with other selections for sight reading. *Professors* MANATT *and* ALLINSON.

Three hours. Second Term. Elective for students who have credit for 1. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Tu., Th., Sat., at 12.20.*

3. *Homer*

The *Odyssey,* four books; rapid reading of other books; lectures on the life of the Heroic Age as revealed in the poems and illustrated by recent archaeological research. *Professors* MANATT *and* ALLINSON.

Three hours. Third Term. Elective for students who have credit for 2. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Tu., Th., Sat., at 12.20.*

4. *Lucian*

Selected writings. *Professor* ALLINSON.

Three hours. First Term. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

5. *Greek Lyric Poets*

The chief remains of Greek lyric poetry from Alkman to Timotheos (not including Pindar). *Professor* MANATT.

Three hours. Second Term. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

6. *Dramatic Poets*

Lectures on the Greek drama. The *Prometheus* of Aeschylus; the *King Oedipus* of Sophocles. *Professor* ALLINSON.

Three hours. Third Term. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

[7. *Plato and Aeschylus*]

Republic, book X; selections from books I-IX; *Agamemnon. Professor* ALLINSON.

Three hours. First Term. Elective for Juniors and Seniors. Not offered in 1906–7.

[8. *Homer*]

Advanced course in the *Iliad* or the *Odyssey*, intended to serve as an introduction to prehistoric archaeology and as a preparation for teaching Homer. *Professor* MANATT.

Three hours. First Term. Elective for Juniors and Seniors. Not offered in 1906–7.

12. *Thucydides*

The Sicilian Expedition. *Professor* MANATT.

Three hours. Second Term. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

9. *Theocritus and Herondas*

Twenty *Idylls* of Theocritus and selected *Mimes* of Herondas. *Professor* MANATT.

Three hours. Third Term. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

10. *The Drama*

The *Medea* of Euripides and the *Frogs* of Aristophanes, with rapid reading of the *Seven Against Thebes* of Aeschylus for literary criticism. *Professor* ALLINSON.

Three hours. First Term. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

[11. *Herodotus*]

History of the Persian Wars. *Professor* MANATT *and Mr.* PAINE.

Three hours. Second Term. Elective for Juniors and Seniors. Not offered in 1906–7.

[13. *Lucian*]

Advanced course. *Professor* ALLINSON.

Three hours. First Term. Elective for Juniors and Seniors. Not offered in 1906–7.

[14. *Aeschines and Demosthenes*]

Speeches on the Crown; study of the Macedonian period and of Athenian political life. *Professor* MANATT.

Three hours. Second Term. Elective for Juniors and Seniors. Not offered in 1906–7.

[16, 17, 18. *Homer*]

The *Odyssey;* portions of the *Iliad* and the *Hymns* in the original; the remainder of the poems in translation. *Professor* MANATT.

Three hours. Through the year. Elective for Juniors and Seniors. Not offered in 1906–7.

19, 20. *Greek Composition*

Professor ALLINSON.

One hour. Second and Third Terms. Elective for Sophomores, Juniors, and Seniors. *Fri. at 2.20.*

21, 22. *Modern Greek*

Introduction to the language; readings from living Greek authors and Greek newspapers. *Professor* MANATT.

One hour. Second and Third Terms. Elective for Sophomores, Juniors, and Seniors.

23, 24, 25. *Greek Seminary*

Subjects for 1906–7: Aristotle's *Poetic;* Hesiod; the *Homeric Hymns;* Lucian. *Professors* MANATT *and* ALLINSON.

One two-hour session weekly. Through the year. Elective for Graduates and approved Seniors.

[26. *Attic Orators*]

Isaeus; Greek historical inscriptions. *Professor* MANATT.

Two hours. First Term. Elective for Graduates and approved Seniors. Not offered in 1906–7.

[27, 28. *Homer and Mycenaean Archaeology*

The Achillean books of the *Iliad* and the Ithacan books of the *Odyssey* studied in the light of recent archaeological discoveries. *Professor* MANATT.

Two hours. First and Second Terms. Elective for Graduates and approved Seniors. Not offered in 1906–7.

[29. *Demosthenes*]

Private speeches, selected to illustrate the workings of Athenian institutions. *Professor* MANATT.

Three hours. First Term. Elective for Graduates. Not offered in 1906–7.

30, 31, 32. *Hellenistic Greek*

For details see Biblical Literature and History 7, 8, 9 and 10, 11, 12. *Professors* Allinson *and* Fowler.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

33. *Greek Life*

The private and public life of the Greeks studied in the light of their literature and monuments. Syllabus, lectures, and prescribed reading, with frequent reports, written tests, and essays. No knowledge of Greek or Latin required. The course is continued in the Second and Third Terms as Latin 28, 29. The three terms together constitute the course in the History of Greek and Roman Life and Institutions, which alternates with Greek 34, Latin 30, and Indo-European Philology 1. *Professor* Manatt.

Three hours. First Term. Elective for Freshmen and Sophomores. *Mon., Tu., Th., at 11.20.*

[34. *Greek Literature*]

A brief history of the literature of the Greeks from Homer to Theocritus, with study of the masterpieces in the best English translations. No knowledge of Greek or Latin required. This course is continued in the Second and Third Terms as Latin 30 and Indo-European Philology 1. The three terms together constitute the course in Greek and Roman Literature and the History of Language, which alternates with Greek 33, Latin 28, 29. *Professor* Manatt.

Three hours. First Term. Elective for Freshmen and Sophomores. Not offered in 1906–7.

36. *Introduction to Greek Archaeology*

Outline of the remains of the earliest Greek civilization; an introductory study of Greek vases, coins, small bronzes, and terra-cotta figurines. Intended to give a general survey of these sources for Greek history and life. Illustrated lectures; collateral reading. *Professor* King.

Three hours. Third Term. Elective for any student in the Women's College who has completed one course in Latin or Greek.

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The Harkness Classical Club meets once a month for the reading of papers and for discussion. Arrangements also are made from time to time for public addresses.

XII. HISTORY ‡

William MacDonald, Ph.D., LL.D., *Professor of History*
Wilfred Harold Munro, A.M., *Professor of European History*

1. *Mediaeval and Modern History of Europe*

A general survey of the history of western Europe from the time of the barbarian invasions to the Napoleonic wars. A narrative text-book supplemented by lectures, frequent written tests, and written reports and abstracts on assigned reading and topics for special investigation. *Professor* MacDonald.

Three hours. First and Second Terms. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy in either the Sophomore or the Junior year. *Tu., Wed., Sat., at 9.20.*

2. *Spanish History*

Development of Spanish institutions, political and social; rise and greatness of Spain as a European power; its colonial system; its position with reference to the Reformation and the subsequent religious wars. *Professor* Munro.

Three hours. First Term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

3. *Islam and the Crusades*

Social and political conditions in Europe and the East at the beginning of the Crusades; organization and internal condition of Islam; effect of the Crusades on the thought, life, and political development of Europe. *Professor* Munro.

Three hours. Second Term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

4. *Period of the Renaissance*

Preparation for the Renaissance in the intellectual and social life of Europe; spread of the revival; connection between the Renaissance and the Reformation; artistic and literary aspects of the movement. *Professor* Munro.

Three hours. First Term. Elective for Juniors, Seniors, and Graduates, *Tu., Fri., Sat., at 10.20.*

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‡ The elective courses in History are regularly open only to those who have credit for 1; but, by special permission of the instructor, elective courses may be taken by Juniors and Seniors who are at the same time taking 1. The only elective courses in History open to Sophomores are 6 and 7.

5. *Period of the Reformation*

Early movements of dissent from the Roman Church; the Protestant revolt in Germany, Switzerland, France, and England; the political and social aspects of the Reformation; the religious wars; the effect on religious belief and church organization. *Professor* MUNRO.

Three hours. Second Term. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.20.*

6. *The French Revolution*

Rise and progress of the Revolution in France; political and social conditions in Europe 1789–1815; permanent results of the Revolution, particularly its effect on political thought and practice. *Professor* MUNRO.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates, and for Sophomores who have credit for 1. *Mon., Wed., Fri., at 12.20.*

7. *European History since 1815*

Political development of the more important states and their diplomatic relations; the revolutions of 1830 and 1848; the free-trade movement in England; the achievement of Italian unity; the founding of the German Empire; the Franco-Prussian War; the Eastern question, etc. *Professor* MUNRO.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates, and for Sophomores who have credit for 1. *Tu., Th., Sat., at 12.20.*

[8, 9, 10. *English Constitutional and Political History to 1689*]

Formation of the English constitution; establishment and growth of the church; relations with Scotland and Ireland; the Reformation; the Puritan Revolution. *Professor* MUNRO.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. Not offered in 1906–7. To be offered in 1907–8.

11, 12, 13. *English Constitutional and Political History since 1689*

Foreign relations; the development of party government and the cabinet system; the social and political changes of the nineteenth century. *Professor* MUNRO.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Tu., Th., at 2.20.*

14, 15, 16. *Seminary in European History*

Discussion of assigned subjects, reports of reading and investigation, and similar exercises. *Professor* Munro.

Three hours. One hour of class-room attendance. Through the year. Elective for Graduates and approved Seniors. Each term may be elected independently.

17. *American History to 1763*

American colonial history as illustrative of the colonial policies of European states in the 16th–18th centuries; development of colonial and local forms of government; intercolonial wars; colonial slavery. Lectures, supplemented by assigned reading and detailed study of the texts of representative documents. *Professor* MacDonald.

Three hours. First and Second Terms. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

18. *The American Revolution, 1763–1787*

Lectures, supplemented by assigned reading and detailed study of the texts of representative documents. *Professor* MacDonald.

Third Term. Elective for Juniors, Seniors, and Graduates who have credit for 17, and for others by consent of the instructor. *Wed., Fri., Sat., at 11.20.*

[19, 20, 21. *History of the United States, 1787–1877*]

The organization of the national government and its administrative development; slavery; extension of national territory; the bank controversy; the Civil War; the reconstruction period. Third term devoted to the period from 1861 to 1877. Methods of instruction as in 17 and 18. *Professor* MacDonald.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may, by the consent of the instructor, be elected separately. Not offered in 1906–7. To be offered in 1907–8.

26. *History of the United States since 1877*

The chief political movements and the constitutional development of the last twenty-five years. *Professor* MacDonald.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates, who have had at least three terms in History in addition to the required work. *Mon., Th., Fri., at 9.20.*

22, 23, 24. *Seminary in American History*

Designed to afford training in historical investigation and practice in the use of sources. Each member of the class is expected to present each term a piece of written work, on an assigned topic, embodying the results of special research. The subjects vary from year to year, being chosen from the colonial and the constitutional periods in alternate years. For 1906–7 the subjects are: First and Second Terms, Selected topics in the constitutional and ecclesiastical history of the New England colonies; Third Term, The Navigation Acts and Acts of Trade. *Professor* MACDONALD.

Three hours. One hour of attendance. Through the year. Elective for Graduates and approved Seniors. The course presupposes a knowledge of 17, 18 or 19, 20, 21, but by special permission it may be taken by those who are taking 17, 18 or 19, 20, 21. Each term may, by the consent of the instructor, be elected separately.

25.* *Principles of Historical Criticism and Research*

First and Second Terms, the general principles of historical criticism and the literature of historical theory; Langlois and Seignobos's *Introduction to the Study of History* is used as a manual. Third Term, Historical bibliography, the periods chosen varying from year to year. *Professor* MACDONALD.

One hour. Through the year. Elective for Graduates of one year's standing. Required of all candidates for the degree of Doctor of Philosophy in History.

XIII. INDO-EUROPEAN PHILOLOGY

FRANCIS GREENLEAF ALLINSON, PH.D., *David Benedict Professor of Classical Philology*

[1. *General Introduction to the Study of Language*]

Outline of the history of language; the Indo-European family. Adapted for students of ancient or modern languages. A continuation of Greek 34, Latin 30. The three terms together constitute the course in Greek and Roman Literature and the History of Language.

Three hours. Third Term. Elective for Freshmen and Sophomores. Not offered in 1906–7.

4. *Seminary in Comparative Philology*

For advanced students in Greek and Latin.

One two-hour session weekly. Third Term. Elective for Graduates and approved Seniors.

7, 8, 9. *Sanskrit, elementary course*

Whitney's *Grammar;* Lanman's *Reader;* selections from the *Vedic Hymns.*

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

[10, 11, 12. *Sanskrit, advanced course*]

Vedic Hymns, and other selections.

One hour. Through the year. Elective for students who have credit for 7, 8, 9. Not offered in 1906–7.

XIV. MATHEMATICS‡

Nathaniel French Davis, A.M., LL.D., *Professor of Pure Mathematics*

Henry Parker Manning, Ph.D., *Assistant Professor of Pure Mathematics*

Frederick Slocum, Ph.D., *Assistant Professor of Astronomy*

Clinton Harvey Currier, A.M., *Instructor in Mathematics*

George Barrows Obear, Sc.M., *Assistant in Mathematics*

3. *Algebra*

Professors Davis *and* Manning, *Messrs.* Currier *and* Obear.

Four hours. First Term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Tu., Wed., Fri., Sat.: 1st and 4th div. at 8; 2d, 3d, and 5th div. at 9.20.*

1. *Geometry, Solid and Spherical*

Professors Davis, Manning, *and* Slocum, *Mr.* Obear.

Four hours. Second Term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Tu., Wed., Fri., Sat.: 1st and 4th div. at 8; 2d, 3d, and 5th div. at 9.20.*

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‡ The Undergraduate courses 1–11 should be taken in the order in which they are printed. Courses 12, 13, 14 may be taken at any time after the Freshman year. Courses 17–21 are designed for students who are taking or who intend to take engineering courses. Courses 22–26 are designed for Graduates; two or three of these courses are offered each year according to the needs of the students. For those who have taken all of them, other courses can usually be arranged.

2. *Trigonometry*

Professors MANNING *and* SLOCUM, *Messrs.* CURRIER *and* OBEAR.

Four hours. Third Term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Tu., Wed., Fri., Sat.: 1st and 4th div. at 8; 2d, 3d, and 5th div. at 9.20.*

4. *Analytic Geometry*

Professor DAVIS.

Three hours. First and Second Terms. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. Elective for students who have credit for 1, 2, 3. *Mon., Wed., Fri., at 12.20.*

5. *Differential Calculus*

Professor DAVIS.

Three hours. Third Term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. Elective for students who have credit for 4. *Mon., Wed., Fri., at 12.20.*

6. *Integral Calculus*

Professor DAVIS.

Three hours. First Term. Elective for students who have credit for 5. *Tu., Th., Sat., at 12.20.*

7. *Applications of the Differential Calculus*

Professor DAVIS.

Three hours. Second Term. Elective for students who have credit for 5 and 6. *Tu., Th., Sat., at 12.20.*

8. *Applications of the Integral Calculus*

Professor SLOCUM.

Three hours. Third Term. Elective for students who have credit for 6. *Tu., Th., Sat., at 12.20.*

9, 10, 11. *Differential Equations*

Professor MANNING.

Three hours. Through the year. Elective for students who have credit for 6 or 21. First Term required of candidates for the degree of Bachelor of Science in Electrical Engineering. *Mon., Wed., Fri., at 12.20.*

12. *Determinants and Theory of Equations*

Professor Manning.

Three hours. Second Term. Elective for students who have credit for 3 or 16.

13. *Modern Methods of Analytic Geometry*

Professor Manning.

Three hours. Third Term. Elective for students who have credit for 4 or 19.

[14. *Solid Analytic Geometry*]

Professor Manning.

Three hours. Third Term. Elective for students who have credit for 4 or 19. Not offered in 1906–7.

15. *Spherical Trigonometry*

Mr. Currier.

One hour. First Term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. Elective for students who have credit for 2 and who have not taken Spherical Trigonometry. *Mon., Th., at 9.20.*

16. *Algebra*

Professor Slocum *and Mr.* Currier.

One hour, First Term. Two hours, Second and Third Terms. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. *Mon., Th., at 9.20.*

17. *Algebra*

Professor Slocum *and Mr.* Currier.

Six hours. First Term. Required of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat.: 1st div. at 8; 2d div. at 9.20; 3d div. at 10.20.*

18. *Trigonometry, Plane and Spherical*

Professor Slocum *and Mr.* Currier.

Six hours. Second Term. Required of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat.: 1st div. at 8; 2d div. at 9.20; 3d div. at 10.20.*

19. *Analytic Geometry*

Professors Davis *and* Slocum, *Mr.* Currier.

Six hours. Third Term. Required of candidates for the degree of Bachelor of

Science. *Mon., Tu., Wed., Th., Fri., Sat.: 1st div. at 8; 2d div. at 9.20; 3d div. at 10.20.*

20. *Differential Calculus*

Professors DAVIS *and* SLOCUM.

Five hours. First Term. Required of candidates for the degree of Bachelor of Science. *Tu., Wed., Th., Fri., Sat., at 8.*

21. *Integral Calculus*

Professor DAVIS *and Mr.* CURRIER.

Three hours. Second and Third Terms. Required of candidates for the degree of Bachelor of Science. *Tu., Wed., Fri., at 8.*

22. *Theory of Functions*

Professor MANNING.

Three hours. Through the year. Elective for Graduates and approved Seniors.

[23. *Differential Equations, advanced course*]

Professor MANNING.

Three hours. Through the year. Elective for Graduates who have credit for 22. Not offered in 1906–7.

[24. *Advanced Algebra*]

Professor MANNING.

Three hours. Through the year. Elective for Graduates and for approved Seniors. Not offered in 1906–7.

25. *General Theory of Curves and Surfaces*

Professor MANNING.

Three hours. Through the year. Elective for Graduates and approved Seniors.

[26. *Quaternions and allied subjects*]

Professor MANNING.

Three hours. Through the year. Elective for Graduates and approved Seniors. Not offered in 1906–7.

XV. MECHANICAL ENGINEERING‡

William Herbert Kenerson, M.E., *Assistant Professor of Mechanical Engineering*

Thurston Mason Phetteplace, Ph.B., M.E., *Instructor in Mechanical Engineering*

William Day Appleton, M.E., *Assistant in Mechanical Engineering*

Henry Dewees Cady, *Instructor in Shop Practice*

1, 2, 3. *Wood-work*

Exercises in carpentry, wood-turning, and pattern-making. *Mr.* Cady.

Three hours in any term. Seven hours of attendance. Elective for Sophomores, Juniors, and Seniors, who have had instruction in drawing. *Tu. 2.20 to 5.20; Fri. 2.20 to 6.20.*

4, 5, 6. *Metal-work*

Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. *Mr.* Cady.

Three hours in any term. Seven hours of attendance. Elective for Sophomores, Juniors, and Seniors, who have had instruction in drawing. *Wed. 2.20 to 5.20; Fri. 2.20 to 6.20.*

8. *Kinematics*

Velocity ratios, rolling surfaces, cams, and belting. Recitations, drawing, and the solution of problems. *Mr.* Phetteplace.

Three hours. Seven hours of attendance. Third term. Elective for students who have credit for Mechanical Drawing 5. *Tu. 12.20, 2.20 to 5.20; Fri. 2.20 to 5.20.*

9, 10, 11. *Kinematics*

Gearing, linkwork, parallel motions, and gear trains; machine tools; the application of the principles involved. Recitations, drawing, and the solution of problems. *Mr.* Phetteplace.

Three hours. Seven hours of attendance. Through the year. Elective for students who have credit for 8 and for Mechanical Drawing 5. *Mon. 2 to 6; Th. 2.20 to 5.20.*

12, 13, 14, 15. *Machine Design*

Applications of the principles of mechanics and the strength of materials to the design of representative types of boilers, engines, and various mechanisms; solution of problems illustrating the method of designing bolts and nuts, keys, journals and bearings, fly-wheels, valve gears, etc. Lectures, calculation, and drawing. *Mr.* PHETTEPLACE.

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‡ All courses in this department are required of candidates for the degree of Bachelor of Science in Mechanical Engineering. Courses 1–7 are all elective for Sophomores, Juniors, and Seniors, but not more than two of them may be counted towards the degree of Bachelor of Arts or Bachelor of Philosophy.

Three hours. Six hours of attendance. First, Second, Third, and Third Terms. Elective for students who have credit for 8, 9, 10, 11 and Mechanics 1. *Mon., Th., 10.20 to 1.20.*

16, 17, 18. *Thermodynamics*

Applications of the principles of gases and vapors to steam, gas, and other heat engines, air-compressors, refrigerating apparatus, etc.; discussion of the energy of fuel and the utilization of such energy for power purposes by means of various media; laws of the relation of variations of pressure, temperature, and volume of such media; design of cylinders to produce a desired amount of power; the principles of the injector and the ejector. *Professor* KENERSON.

Three hours. First, Second, and Third Terms. Elective for students who have credit for Physics 1, 2, 3 and Mathematics 5, 6, 7 or 20, 21. First and Second Terms, *Wed., Fri., Sat., 11.20 to 1.20.* Third Term, *Mon., Wed., Th., 9.20 to 11.20.*

19, 20, 21. *Steam Engineering*

Applications of the principles of thermodynamics and mechanics to the production, transmission, utilization, and measurement of power; valves and valve gears, and valve setting; indicator practice and tests of various forms of steam engines, gas engines, etc.; standardization of auxiliary apparatus used in making the various tests; boiler testing; flue gas and fuel analysis, etc. Lectures, recitations, and laboratory work. *Professor* KENERSON.

Three hours. First, Second, and Third Terms. Elective for students who have taken or are taking 16, 17, 18. First and Second Terms, *Tu., Wed., Sat., at 9.20; Tu. 2.20 to 4.20.* Third Term, *Mon., Wed., Th., at 8; Tu. 2.20 to 4.20.*

22. *Materials of Engineering*

Study of the sources, manufacture, and properties of the important materials used in engineering; laboratory tests to determine the behavior of materials when subjected to tensile, compressive, and tortional stresses; mixing and testing of cements and mortars; preparation and examination of sections for the microscopical study of the structure of metals and alloys. Lectures, recitations and laboratory work. *Professor* Kenerson *and Mr.* Phetteplace.

Three hours. First and Second Terms. Elective for students who have credit for Mechanics 1. *Wed., Fri., at 10.20. 1st div. Mon. 2.20 to 4.20; 2d div. Tu. 2.20 to 4.20; 3d div. Th. 2.20 to 4.20.*

23. *Power Plant Engineering*

Discussion of the relation and coördination of the various parts of the complete power plant; management, and methods of determining efficiency; selection of the best equipment from manufacturers' catalogues and actual inspection. Lectures, recitations, tests, and tours of inspection. *Professor* Kenerson *and Mr.* Phetteplace.

Three hours. First Term. Elective for students who have credit for 19, 20, 21. *Wed., Fri., 2.20 to 5.20.*

24. *Advanced Laboratory Course*

Investigation of special problems in hydraulic and steam engineering. Determination of experimental constants for the Venturi meter, flow of water over weirs and through pipes, flow of air, steam, etc. Particular emphasis laid on preparation and form of reports. *Professor* Kenerson.

Three hours. Second Term. *Wed., Fri., 2 to 5.*

25. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Mechanical Engineering. The thesis must embody either a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XVI. MECHANICS AND MECHANICAL DRAWING

Otis Everett Randall, Ph.D., *Professor of Mechanics and Mechanical Drawing*

Ansel Brooks, Ph.B., M.E., *Assistant Professor of Mechanics and Mechanical Drawing*

Frank Arthur Burr, M.E., *Assistant in Mechanical Drawing*

MECHANICS

1. *Mechanics of Solids*

Statics, including resolution and composition of forces, determination of center of gravity, and problems relative to rigid bodies and flexible cords; dynamics, including rectilinear and curvilinear motion, virtual velocity, moment of inertia, work, energy and power, and friction; strength of materials, including tension, compression, shearing, torsion, flexure, and arches; methods of graphical solution of problems. *Professors* RANDALL *and* BROOKS.

Three hours. Through the year. Elective for students who have credit for Mathematics 4 and 5, and who have taken or are taking Mathematics 6. First and Second Terms required of all candidates for the degree of Bachelor of Science. *Mon., Tu., Th., at 11.20.*

3. *Strength of Materials*

Tension, compression, shearing, torsion, flexure, arches, and graphical solution of problems. *Professors* RANDALL *and* BROOKS.

Six hours. Third Term. Required of all candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., at 11.20.*

2. *Mechanics of Fluids*

Hydrostatics; nature and use of instruments; flow through orifices, over weirs, through tubes, through pipes, in conduits, flow of rivers, water supply and water power, dynamic pressure of water, water wheels, turbines, pumps and pumping. *Professor* RANDALL.

Three hours. First and Second Terms. Required of all candidates for the degree of Bachelor of Science. Elective for students who have credit for 1. *Wed., Fri., Sat., at 11.20.*

4. *Advanced Mechanics*

Higher theoretical and practical problems. *Professor* RANDALL.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 1 or 3.

MECHANICAL DRAWING

1. *Elementary Mechanical Drawing, and Descriptive Geometry*

Nature, care, and use of drafting instruments; plane problem construction; theory of orthographic projection; discussion, proof, and graphic solution of problems in descriptive geometry relating to the point, line, and plane, to line and surface generation and classification, to surface tangency, and to intersections and developments; application of the principles of descriptive geometry in isometric drawing, in shades and shadows and perspective, in machine drawing, and in practical engineering problems. *Professors* RANDALL *and* BROOKS, *Mr.* BURR.

Four hours. Through the year. First Term, two hours of recitation and six hours of drawing. Second and Third Terms, three hours of recitation and three hours of drawing. Required in the Freshman year of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., at 9.20 and 10.20.*

2. *Elementary Mechanical Drawing*

Nature, care, and use of drafting instruments; plane problem construction; theory of orthographic and isometric projection. *Professor* RANDALL *and Mr.* BURR.

Three hours. Six hours of drawing. First Term. Elective for Freshmen who are candidates for the degree of Bachelor of Philosophy, and for all Sophomores, Juniors, and Seniors. *Mon., Wed., Th., at 10.20.*

3. *Descriptive Geometry*

Discussion, proof, and graphic solution of problems in descriptive geometry. *Professor* RANDALL *and Mr.* BURR.

Three hours. Two hours of recitation and two hours of drawing. Second and Third Terms. Elective for Freshmen who are candidates for the degree of Bachelor of Philosophy, and for Sophomores, Juniors, and Seniors who have credit for 2. *Mon., Wed., Th., at 10.20.*

4, 5. *Machine Drawing*

Study and representation of machine parts; the principles of elementary machine design; sketches, detail and assembly drawings of machines; practice in reading drawings. *Professor* BROOKS.

Three hours. One hour of recitation and eight hours of drawing. First and Second Terms. Required of candidates for the degree of Bachelor of Science in Mechanical Engineering and Electrical Engineering. Elective for students who have credit for 1 or 3. *Tu. at 12.20; Mon., Th., 2.20 to 5.20.*

6. *Elements of Machine Design*

Professor BROOKS.

Three hours. One hour of recitation and five hours of drawing. Third Term. Elective for students who have credit for 5.

7. *Shades and Shadows and Perspective; Architectural Drawing*

Problems relating to the shade and shadow and perspective of elementary magnitudes; the principles of architectural design and composition; working drawings and ordinary office practice. *Professor* Randall.

Three hours. Six hours of drawing. Through the year. Elective for students who have credit for 1 or 3. Given at the University during the First Term, and at the Rhode Island School of Design during the Second and Third Terms.

8. *Mechanical Drawing, practical*

For students desiring to continue their course in drawing without taking the theoretical work of descriptive geometry. Intersections and developments; third quadrant projection; sketching and dimensioning; conventional methods of representing machine parts; detailing and assembling; exercises in reading drawings; architectural drawing, including the drawing of plans and elevations, and the details of building construction. *Professor* Brooks.

Three hours. Six hours of drawing. Second and Third Terms. Elective for students who have credit for 2. *Mon., Wed., Th., at 10.20.*

XVII. PHILOSOPHY

William Herbert Perry Faunce, A.M., D.D., LL.D., *Professor of Moral and Intellectual Philosophy*

Edmund Burke Delabarre, Ph.D., *Professor of Psychology*

Walter Goodnow Everett, Ph.D., *Professor of Philosophy and Natural Theology*

Walter Ballou Jacobs, A.M., *Professor of the Theory and Practice of Education*

Alexander Meiklejohn, Ph.D., *Associate Professor of Logic and Metaphysics*

1. *Logic*

Aims, methods, and limitations of human thinking; a preparation for work in the sciences and in philosophy. First Term, general introduction and formal logic. Second Term, principles and methods of the natural sciences. Third Term, relations of science to philosophy; philosophical interpretation and criticism of the results of science. *Professor* Meiklejohn.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon., Th., Fri., at 9.20.*

2. *Psychology, introductory course*

The main facts and laws of mental life, with particular attention to their arrangement in a scientific system, and to their philosophical bearing. The course furnishes a knowledge of mental law important for practical life, and serves also as a transition from the special sciences to philosophy. *Professor* DELABARRE.

Three hours. Through the year. Elective for Juniors, *Wed., Fri., Sat., at 11.20.*

3. *Psychology, advanced course*

A seminary for the discussion of important and interesting questions in psychology, especially the problems of mental composition, of the relation of mind and body, and of hypnotism and psychical research. *Professor* DELABARRE.

Three hours. Through the year. Elective for Seniors and Graduates.

4. *Experimental Psychology, introductory laboratory course*

Description of the main lines and results of experimental research; demonstrations by the instructor or the class; training in the use of apparatus and in careful scientific observation and measurement. *Professor* DELABARRE.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have taken or are taking 2. Although essentially a year course, it may, by special arrangement with the instructor, be taken for a shorter period.

5. *Experimental Psychology, advanced laboratory course*

The problems investigated vary and the course may therefore be taken two or more years in succession. The aim is to make original contributions to scientific knowledge in psychology and to publish the results. *Professor* DELABARRE.

One to six hours. Two to twelve hours of attendance. Through the year. Elective for students who have credit for 4. May be taken for more than six hours by Graduates.

6, 7, 8. *History of Philosophy*

The successive philosophical systems in their dialectical development and mutual relations; treatment not merely analytic and historical, but synthetic and constructive as well. First Term, Greek philosophy. Second Term, mediaeval and early modern philosophy. Third Term, recent and contemporary philosophy. *Professor* EVERETT.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

9, 10. *Theoretical Ethics*

Intended to aid in mastering the fundamental problems of life and character. First Term, a discussion of the nature and relations of ethics and an outline of the history of the chief ethical systems. Second Term, a critical study of the fundamental concepts of ethics with the aim of constructing a tenable theory of conduct. *Professor* EVERETT.

Three hours. First and Second Terms. Elective for Seniors and Graduates. *Tu., Wed., Sat., at 9.20.*

11. *Practical Ethics*

The application of ethical theory to the life of the individual, the family, and the state. Discussion of current problems, personal, industrial, and social, from the ethical standpoint. *President* FAUNCE.

Three hours. Third Term. Elective for Juniors. *Tu., Wed., Sat., at 9.20.*

12. *Philosophy of Religion*

An investigation of the ultimate problems of religious belief. *Professor* EVERETT.

Three hours. Third Term. Elective for Seniors and Graduates who have credit for one course in Philosophy. *Tu., Wed., Sat., at 9.20.*

13, 14, 15. *Philosophical Seminary*

Lectures, written reports, and discussions on the more difficult problems of philosophy. Subject for 1906–7 to be announced later. *Professor* EVERETT.

Three hours. Through the year. Elective for Graduates.

16. *Kantian and Post-Kantian Philosophy*

Kant's *Critique of Pure Reason* studied as the source of German rationalism. *Professor* MEIKLEJOHN.

Three hours. Through the year. Elective for Seniors who have credit for 6, 7, 8, and for Graduates.

EDUCATION‡

Professor JACOBS

1. *History of Education*

Education among the early culture peoples as forming and perpetuating their civilization; the development of education in Greece and Rome as parallel to the development of thought and learning; early Christian education; the renaissance and humanism; the rise of realism in thought and education. The history of education considered from the point of view of the history of civilization.

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‡ Courses 1, 2, and 3 treat education in its relation to the individual and to the social and political whole: their interest is therefore not limited to those who intend to teach.

Three hours. First term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

2. *Critical Study of Modern Education*

The beginnings of modern education; the naturalistic movement—Rousseau; the psychological movement—Pestalozzi, Froebel, Herbart; the scientific movement—Spencer; recent sociological tendencies; current experiments; problems which an adequate theory of education must solve.

Three hours. Second Term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

3. *Fundamental Principles of Education*

The meaning and aim of education; the function of education as a social institution; the sequence and coördination of studies; the principles of instruction; apperception; the steps in method; the use of the type in instruction; the training of the will; the principles of moral education.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

4. *Psychology of Education*

Theory and process of mental development, with special emphasis upon the period of adolescence; psychology of method, and of the various studies and disciplines; ways in which student and teacher may utilize a knowledge of the more fundamental activities of the mind.

At the same time they form an introduction to the more advanced courses in Education. Those who intend to teach are advised to elect these courses during the Junior year.

Courses 1–6 cover the usual requirements for certificates of the First Grade except where practice teaching or experience is demanded. In Rhode Island a certificate is required of all teachers in schools supported in whole or in part by public money. Certificates of the First Grade are granted without examination to those who have completed courses 1–6 and hold a college degree. Due credit is also given for separate courses. Those who wish the New York State certificate should also elect Philosophy 2.

Three hours. First Term. Elective for Seniors and Graduates who have credit for 1, 2, or 3, or who are taking 1. *Mon., Tu., Th., at 11.20.*

5. *Hygiene of Education*

A study of bodily growth and development; special emphasis upon the period of adolescence; play and fatigue; physical culture and athletics; arrested growth; the conditions and surroundings which favor or retard normal development; school hygiene.

Three hours. Second Term. Elective for Seniors and Graduates who have credit for 1, 2, or 3, or who are taking 2. *Mon., Tu., Th., at 11.20.*

6. *Practical Introduction to Teaching*

The method of the recitation; management and discipline of classes; observation of good teaching; practical applications of method.

Three hours. Third Term. Elective for Seniors and Graduates who have taken or are taking other courses in Education. *Mon., Tu., Th., at 11.20.*

7, 8, 9. *Methods in Secondary School Studies and the Organization, Equipment, and Management of Secondary Schools*‡

Importance and meaning of secondary school studies; their organization into a curriculum; method as applied to each subject; the resources at the command of the teacher. The following studies receive special attention: First Term, Latin and modern languages; Second Term, history and English ; Third Term, science and mathematics.

Three hours. Through the year. Two hours of class-room attendance. Required of student-teachers. Elective for Graduates and experienced teachers. *Wed. 3.20 to 5.20.* Each term may be elected independently.

10, 11, 12. *Problems in Practical Teaching; Secondary Schools*‡

Practice teaching in the Providence High Schools under experienced teachers. Observation, reports, and conferences. Designed for those who wish to become instructors in colleges, teachers or principals in secondary schools, or superintendents of schools.

Three hours. Through the year. Elective for approved Graduates who have credit for elementary courses in Education and who are taking 7, 8, 9 and 16, 17, 18. *Fri. at 3.20*, and at other hours to be arranged.

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‡ In connection with this course, and for an explanation of the work of student-teachers, see page 149 of the Catalogue for 1905–6, under Arrangements with the School Committee of the City of Providence.

13, 14, 15. *Problems in Practical Teaching; Grammar Grades*‡
Practice teaching in the Providence Grammar Schools under experienced teachers. Observation, reports, and conferences. Designed especially for those who wish to become grade teachers, principals of grammar schools, or superintendents of schools, but also for those who wish to teach in secondary schools. The following studies receive special attention: First Term, arithmetic; Second Term, language; Third Term, history and geography.

Three hours. Through the year. Elective for approved Graduates who have credit for elementary courses in Education and who are taking 16, 17, 18. Elective also by special permission for a limited number of Seniors. *Mon. at 3.20*, and at other hours to be arranged.

16, 17, 18. *Seminary in Education*‡
Reviews and discussions of recent publications; reports on special studies undertaken by members. The subjects vary from year to year. For 1906–7 they are: First Term, recent educational theory. Second Term, moral education. Third Term, an intensive study of some period in the history of education.

Three hours. Two hours of class-room attendance. Required of student-teachers. Elective for Graduates and experienced teachers. *Sat. 10.20 to 12.20.* Each term may be elected independently,

XVIII. PHYSICS

Carl Barus, Ph.D., *Hazard Professor of Physics*
Albert deForest Palmer, Jr., Ph.D., *Associate Professor of Physics*
Arthur Eugene Watson, Ph.D., *Assistant Professor of Physics*

1, 2, 3. *Elementary Physics*§
First Term, kinematics and dynamics. Second Term, molecular physics. Third Term, electricity. Lectures, illustrated by experiments and the lantern; weekly written exercises corrected in detail by the instructors. Designed for those who have had little previous training in physics. *Professor* Barus.

Three hours. Through the year. Elective for Undergraduates who have credit for Mathematics 1, 2, 3. *Mon., Wed., Th., at 10.20.*

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‡ In connection with this course, and for an explanation of the work of student-teachers, see page 149 of the Catalogue for 1905–6, under Arrangements with the School Committee of the City of Providence.

§ Graduates attending courses 1, 2, 3, 4, 5, 6 are held responsible for all the demonstrations, or for the full equivalent of either Watson's or Daniel's *Principles of General Physics*.

4, 5, 6. *Elementary Physics, continued* ‡

First Term, optics. Second Term, acoustics. Third Term, heat. Methods as in 1, 2, 3. *Professor* Barus.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1, 2, 3. *Tu., Fri., Sat., at 10.20.*

7. *Physical Measurements*

Elementary theory and practice of physical manipulation. Reports of experiments and solution of problems. *Professor* Palmer.

Three hours. Six hours in the laboratory. Through the year. Elective for students who have credit for 1, 2, 3 or 4, 5, 6. *Mon. at 12.20.*

8, 9, 10. *Mathematical Treatment of Dynamical Problems* §

Lectures. First Term, discussion of the general principles of dynamics and the development of the general equations of motion. Second and Third Terms, application of these principles to special problems in thermodynamics and hydrodynamics. *Professor* Palmer.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 7 and Mathematics 9.

11, 12, 13. *Mathematical Theory of Electricity and Magnetism* §

Lectures. Includes a discussion of the more important problems of electrical science. *Professor* Palmer.

Three hours. Through the year. Elective for Graduates and Seniors who have credit for 7 and Mathematics 9.

14, 15, 16. *Advanced Laboratory Course*

Special problems and reference to original sources for methods of solution. *Professors* Barus, Palmer, *and* Watson.

Three or six hours. Six or twelve hours of attendance. Through the year. Elective for students who have credit for 7.

17, 18, 19. *Applied Harmonic Analysis* ||

Importance of Fourier's method shown by examples drawn from the analytical theory of heat, from elastics, alternating electricity, and

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‡ Graduates attending courses 1, 2, 3, 4, 5, 6 are held responsible for all the demonstrations, or for the full equivalent of either Watson's or Daniel's *Principles of General Physics.*

§ Of the two courses 8, 9, 10 and 11, 12, 13, only one will be offered in any given year. In determining which shall be offered, the preference of applicants will be considered.

|| Of the two courses 17, 18, 19 and 20, 21, 22, only one will be offered in any given year. In determining which shall be offered, the preference of applicants will be considered.

elsewhere; treatment by the aid of spherical harmonics, Bessel functions, and Lamé functions. *Professor* BARUS.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 1, 2, 3 and Mathematics 7, 9.

20, 21, 22. *Physics, advanced course*[‡]

Lectures on dynamics, potential elastics, hydrostatics, hydrodynamics, viscosity, capillarity, electrostatics, magnetism, electro-magnetism, thermo-electrics, induction, Fresnel's optics, the electromagnetic theory of light, thermal analytics, and thermodynamics. Completed in two years. *Professor* BARUS.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates, who have credit for Mathematics 5, 6, 7.

23. *Precision Measurements in Photometry, Electricity, Magnetism, and Electro-Chemistry*

Professor PALMER.

Three hours. Six hours in the laboratory. Through the year. Elective for students who have credit for 7 and Mathematics 6.

ELECTRICAL ENGINEERING[§]

Professor WATSON

1, 2, 3. *General Course*

First Term, definite instruction in methods of generating and utilizing electric currents. Second Term, technical study of theory and working of direct current dynamo-electric machinery. Third Term, practical methods of operating and testing various sizes and types of standard dynamos and accessory apparatus; lectures on alternating current machinery.

Three hours. Through the year. Elective for students who have taken or are taking Physics 3 and 7 and Mathematics 12. First Term, *Mon., Th., Fri., at 9.20.* Second and Third Terms, *Mon., Th., at 9.20.*

4, 5, 6. *Alternating Currents*

Mathematical and graphical treatment.

Three hours. Two hours of recitation and two hours of laboratory work.

[‡] Of the two courses 17, 18, 19 and 20, 21, 22, only one will be offered in any given year. In determining which shall be offered, the preference of applicants will be considered.

[§] All the courses in this department are required of candidates for the degree of Bachelor of Science in Electrical Engineering.

Through the year. Elective for students who have credit for 3 and who have taken or are taking Mathematics 9. *Mon., Th., Fri., at 11.20.*

7, 8, 9. *Industrial Electricity*

First Term, telephone and telegraph engineering. Second Term, history of electrical engineering. Third Term, design and calculation of direct current machinery, including actual drawing of electrical machinery in connection with Mechanical Engineering 11.

Three hours. Through the year. For candidates for the degree of Bachelor of Science in Electrical Engineering only. To be taken with 1, 2, 3. First Term, *Tu., Wed., Sat., at 9.20.* Second and Third Terms, *Tu., Fri., Sat., at 9.20.*

10, 11, 12. *Special Topics in Electrical Engineering*

First Term, electric railway engineering. Second Term, design and calculation of alternating current machinery. Third Term, central station design and equipment; systems of distribution.

Three hours. Through the year. Elective for students who have credit for 1, 2, 3. First and Second Terms, *Mon., Th., Fri., at 10.20.* Third Term, *Tu., Wed., Sat., at 10.20.*

13. *Specific Electrical Engineering Problems*

Reading and discussion. Seminary method.

Three hours. Third Term. *Mon., Th., Fri., at 10.20.*

14. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Electrical Engineering. The thesis must embody either a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XIX. POLITICAL ECONOMY ‡

Henry Brayton Gardner, Ph.D., *Professor of Political Economy*
William Kirk, Ph.D., *Instructor in Political Economy*

1. *Political Economy, elementary*

Affords a general outline of the subject, and serves as an introduction to the more extended and special courses which follow. *Professor* Gardner.

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‡ The courses in this department other than 1 are open only to those students who have credit for Political Science 1, Social Science 1, and Political Economy 1, which together constitute an introduction to the advanced work of the departments of Social and Political Science and Political Economy.

Three hours. Third Term. Sophomore, Junior, or Senior year. Must be preceded by Political Science 1 and Social Science 1. Required of candidates for the degree of Bachelor of Arts; elective for others who have credit for Political Science 1 and Social Science 1. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Mon., Tu., Th., at 11.20.*

2.* *General Economics*

The development and significance of the more important elements in the existing industrial organization; the principles governing the production, exchange, distribution, and consumption of wealth; the more important practical problems of economic life. *Professor* GARDNER, *First and Second Terms; Dr.* KIRK, *Third Term.*

Three hours. Through the year. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.20.*

[3. *Money and Banking*]

Principles of money and banking; recent monetary and banking history, particularly of the United States; monetary and banking systems of leading industrial nations; present monetary and banking problems. *Professor* GARDNER.

Three hours. First and Second Terms. Elective for Juniors, Seniors, and Graduates. Not offered in 1906–7. To be offered in 1907–8.

4. *Public Finance*

First Term, general principles of public finance; revenues and expenditures of leading industrial nations. Second Term, financial history of the United States. Third Term, local finance: revenues, expenditures, and financial systems of American states and cities. *Professor* GARDNER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Not to be offered in 1907–8. *Wed., Fri., Sat., at 11.20.*

5. *History and Present Tendencies of Political Economy*

Early economic theories: a critical examination of the theories of the early schools of economists, especially the physiocrats and the early English school, with particular attention to the relation between economic thought and economic life and practice. Recent economic theories: a study of the tendencies of the historical school, the Austrian school, and recent English and American writers. The growth of the principle of monopoly, its influence on the production and distribution of wealth and on the economic well-being of society. *Professor* GARDNER *and Dr.* KIRK.

Three hours. One session of an hour and a half weekly. Through the year. Elective for Seniors and Graduates who have credit for Political Economy 2.

6. *The Labor Movement*

History and analysis of the trade-union movement; growth of collective bargaining; labor problems in the United States. *Dr.* KIRK.

Three hours. First Term. Elective for Juniors, Seniors, and Graduates. Not to be offered in 1907-8. *Mon., Tu., Th., at 11.20.*

7. *Socialism*

A brief review of the historically important socialistic schemes; mainly a study of the modern scientific socialism of Karl Marx and of the resulting socialistic movements. *Dr.* KIRK.

Three hours. Second Term. Elective for Juniors, Seniors, and Graduates. Not to be offered in 1907-8. *Mon., Tu., Th., at 11.20.*

[8. *Industrial Corporations*]

Development of the corporate form of business organization; its effects; the problems to which it gives rise. Special emphasis on the recent movements toward combination, and toward control, by the State, of corporations, particularly quasi-public corporations. *Professor* GARDNER.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. Not offered in 1906-7. To be offered in 1907-8.

9. *The Tariff*

The arguments for free trade and protection in relation to the principles of international trade; the history of tariff legislation and its effects in the United States. *Dr.* KIRK.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. Not to be offered in 1907-8. *Mon., Tu., Th., at 11.20.*

10, 11, 12. *Industrial History*

First Term, the chief stages in the development of the industrial life of England, with special emphasis on the origin and development of the existing form of industrial organization. Second Term, the more important aspects of the industrial development of the colonies and the United States to 1860. Third Term, the growth, organization, and geographical distribution of the main branches of industry since 1860; the relation of the industrial life of the United States to that of the world at large. *Professor* GARDNER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. *Tu., Th., Sat., at 12.20.*

20, 21, 22. *Investigation of Special Topics*

Intended to train the student in methods of gathering, handling, and presenting data in the study of economic life and problems. Laboratory methods. *Professor* GARDNER *and Dr.* KIRK.

Three hours. Six hours of attendance. Through the year. Elective for approved Juniors, Seniors, and Graduates. Each term may be elected independently.

XX. ROMAN LITERATURE AND HISTORY

ALBERT GRANGER HARKNESS, A.M., *Professor of Roman Literature and History*

JOHN FRANCIS GREENE, A.M., *Assistant Professor of Roman Literature and History*

LIDA SHAW KING, A.M., *Assistant Professor of Classical Philology*

1. *Livy*

Designed to enable the student to acquire facility in reading Latin, and to instruct him in the use of the Latin texts as a means of gaining a knowledge of Roman history; grammatical study and literary criticism also receive attention. *Professors* HARKNESS *and* GREENE.

Three hours. First Term. Elective for students who presented elementary and advanced Latin for admission. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Sat., at 12.20; 3d div. Mon., Tu., Th., at 2.20.*

2. *Cicero's Letters*

Aims and methods as in 1. *Professors* HARKNESS *and* GREENE.

Three hours. Second Term. Elective for students who presented elementary and advanced Latin for admission. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Sat., at 12.20; 3d div. Mon., Tu., Th., at 2.20.*

3. *Tacitus's Germania and Agricola.*

Aims and methods as in 1. *Professors* HARKNESS *and* GREENE.

Three hours. Third Term. Elective for students who presented elementary and advanced Latin for admission. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Sat., at 12.20; 3d div. Mon., Tu., Th., at 2.20.*

4. *Horace's Odes and Epodes*

Critical study of the poems, supplemented by rapid reading with a view to comprehending the spirit of the author; the literary side of the study is made prominent. Lectures; literary topics assigned to the class for special study. *Professor* HARKNESS.

Three hours. First Term. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

5. *Catullus, Tibullus, and Propertius*

Aims and methods as in 4. *Professor* GREENE.

Three hours. Second Term. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

6. *Satires of Horace*

Aims and methods as in 4. *Professor* HARKNESS.

Three hours. Third Term. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

[7, 8, 9. *Latin Poetry*]

Aims to give a connected and comprehensive view of the history and development of Latin poetry. Forms with 10, 11, 12 a two-years' consecutive course affording a general survey of Roman literature. Lectures on the lives and writings of the authors; reading of characteristic selections; special study by members of the class of assigned topics in literary history and criticism. First Term, Plautus; Second Term, Lucretius; Third Term, Juvenal and Martial. *Professors* HARKNESS *and* GREENE.

Three hours. Through the year. Elective for Juniors and Seniors. Each term may be elected independently. Not offered in 1906–7.

10, 11, 12. *Latin Prose*

Aims to give a connected and comprehensive view of the history and development of Latin prose. Forms with 7, 8, 9 a two-years' consecutive course affording a general survey of Roman literature. Lectures on the lives and writings of the authors, on the development of oratory, etc.; reading of characteristic selections; special study by members of the class of assigned topics in literary history and criticism. First term, specimens of early Latin, Cicero's *Brutus,* and Quintilian; Second Term, Cicero; Third Term, the *Annals* of Tacitus. *Professors* HARKNESS *and* GREENE.

Three hours. Through the year. Elective for Juniors and Seniors. Each term may be elected independently. *Tu., Fri., Sat., at 10.20.*

13, 14, 15. *Petronius, Pliny the Younger, Martial*

Professor HARKNESS.

One hour. Through the year. Elective for Juniors, Seniors, and Graduates. *Fri. at 2.20.*

[16, 17, 18. *Epigraphy*]

Professor HARKNESS.

Two hours. Through the year. Elective for Graduates and approved Undergraduates. Not offered in 1906-7.

22, 23, 24. *Latin Composition*

Professor GREENE.

One hour. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon. at 3.20.*

25, 26, 27. *Seminary in Latin*

Subject for 1906-7: Palaeography and Textual Criticism. Reading from the prose of the Empire. Gudeman's *Latin Literature of the Empire,* vol. I. *Professors* HARKNESS *and* GREENE.

Two hours. Through the year. Elective for Graduates.

28, 29. *Roman Life*

The private and public life of the Romans Intended to give a comprehensive view of the civilization of Rome. Study based on the monuments and literature. Lectures, supplemented by reading and reports. No knowledge of Latin is required. A continuation of Greek 33, the three terms together constituting the course called History of Greek and Roman Life and Institutions. *Professor* GREENE.

Three hours. Second and Third Terms. Elective for Freshmen and Sophomores. *Wed., Fri., Sat., at 11.20.*

[30. *Roman Literature*]

A brief history of Roman literature. Some of the most important and characteristic works studied in English translations. No knowledge of Latin is required. Follows Greek 34 and is continued in the third term by Indo-European Philology 1. *Professor* HARKNESS.

Three hours. Second Term. Elective for Freshmen and Sophomores. Not offered in 1906-7.

[31, 32, 33. *History of the Roman Empire*]

First Term, the Early Empire. Second Term, the Age of the Antonines. Third Term, the Age of Constantine. *Professor* GREENE.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Each term may be elected independently. Not offered in 1906–7.

34. *Vergil*

Bucolics, with special reference to literary sources and influence; *Georgics* and *Aeneid,* with special reference to the history of the times. *Professor* KING.

Three hours. First Term. Elective for Sophomores in the Women's College.

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The Harkness Classical Club meets once a month for the reading of papers and for discussion. Arrangements also are made from time to time for public addresses.

XXI. ROMANCE LANGUAGES AND LITERATURES

COURTNEY LANGDON, A.B., *Professor of the Romance Languages and Literatures*

ALBERT BUSHNELL JOHNSON, A.M., *Associate Professor of the Romance Languages*

ALBERT SWIFT MORSE, A.M., *Assistant Professor of the Romance Languages*

CHARLES HERMAN HUNKINS, A.B., *Instructor in French*

1. *Elementary French*

Grammar, composition, dictation; translation of selections from modern authors into idiomatic English. The equivalent of the French required for admission. *Professor* MORSE *and Mr.* HUNKINS.

Three hours. Through the year. Required of all students who did not present French for admission. *1st and 2d div. Tu., Wed., Sat., at 9.20; 3d div. Mon., Tu., Th., at 2.20.*

2, 3, 4. *French Language, intermediate course*

Syntax, translation of modern authors, written and oral translation into French of exercises based upon the texts read, dictation; intended to give students a large working vocabulary. *Professors* JOHNSON *and* MORSE, *Mr.* HUNKINS.

Three hours. Through the year. Required of all students who presented elementary French for admission. Elective for students who have credit for 1. *1st, 3d, and 5th div. Wed., Fri., Sat., at 11.20; 2d and 4th div. Tu., Th., Fri., at 3.20.*

5, 6, 7. *French Language and Literature*

An introduction to the best French literature of the nineteenth century; includes some study of the language. *Mr.* Hunkins.

Three hours. Through the year. Elective for students who presented advanced French for admission, or who attained only the grade of P in 2, 3, 4. *Mon., Tu., Th., at 11.20.*

[8, 9, 10. *French Literature from 1800 to 1850*]

Chateaubriand, Hugo, Lamartine, De Musset, Balzac, and Gautier; abstracts (in French) of works read outside the class; sight reading a prominent feature. *Professor* Johnson.

Three hours. Through the year. Elective for students who attained the grade of C in 2, 3, 4 or who have credit for 5, 6, 7. Not offered in 1906–7.

[11, 12, 13. *French Literature since 1850*]

Flaubert, the Goncourts, Zola, Daudet, Renan, Augier, the younger Dumas, Rostand, and others; abstracts (in French) of works read outside the class; sight reading a prominent feature. *Professor* Johnson.

Three hours. Through the year. Elective for students who attained the grade of C in 2, 3, 4 or who have credit for 5, 6, 7. Not offered in 1906–7.

14, 15, 16. *Practice in Writing and Speaking French.*

Intended especially for those preparing to teach; a large amount of composition, dictation, and conversation; oral and written abstracts of French passages read in the class by the instructor; oral translation into French of an English novel. *Professor* Johnson.

Three hours. Through the year. Elective for students who attained the grade of C in 2, 3, 4 or 5, 6, 7. *Mon., Tu., Th., at 11.20.*

[17, 18, 19. *Old French*]

The elements of Romance philology and an introduction to the literature of the Middle Ages in France. *Professor* Morse.

Three hours. Through the year. Elective for approved Seniors and Graduates. Not offered in 1906–7.

[20, 21, 22. *French Literature from 1636 to 1800*]

Corneille, Pascal, Madame de La Fayette, Molière, Racine, La Fontaine, Boileau, Bossuet, Madame de Sévigné, Saint-Simon, Marivaux, Le Sage, Voltaire, Beaumarchais, and others. *Professor* Johnson.

Three hours. Through the year. Elective for students who have credit for 10, 13, or 16. Not offered in 1906–7.

23, 24, 25. *The French Drama*

The drama from Corneille to Rostand, with special study of its classical and romantic sources and influences. *Professor* LANGDON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates, who have attained the grade of C in 2, 3, 4. *Tu., Fri., Sat., at 10.20.*

26, 27, 28. *Modern Italian*

Grammar, composition, conversation, and rapid translation of modern authors. *Professor* MORSE.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern foreign language. *Tu., Fri., Sat., at 10.20.*

29, 30, 31. *Italian Literature from 1321 to 1800*

Selections from Petrarch, Sacchetti, Tasso, Macchiavelli, and Goldoni, with a brief survey of the life and history of the times. *Professor* MORSE.

Three hours. Through the year. Elective for students who have credit for 26, 27, 28. *Mon., Tu., Th., at 11.20.*

32, 33, 34. *Dante*

The *Divina Commedia* read in the original. *Professor* LANGDON.

Three hours. Through the year. Elective for students who have credit for 26, 27, 28. *Mon., Wed., Th., at 10.20.*

35, 36, 37. *Dante in English*

A study of the whole of the *Divina Commedia* in English, in the light of modern thought and in connection with other great world-poems such as *Job*, the *Iliad* and the *Odyssey*, the *Aeneid*, *Hamlet*, *Paradise Lost*, *Faust*, and *The Ring and the Book*. An introduction to a study of comparative literature by means of the best available translations. *Professor* LANGDON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

38, 39, 40. *Modern Spanish*

Grammar, conversation, composition, writing from dictation, and rapid reading. *Professor* JOHNSON.

Three hours. Through the year. Elective for Juniors, and for Sophomores not electing more than one other modern foreign language. *Tu., Fri., Sat., at 10.20.*

[41, 42, 43. *Spanish Literature of the Nineteenth Century*]
Gil y Zárate, Moratin, Núñez de Arce, Tamayo, Echegaray, Alarcón, Valera, Galdós, Valdés, and Pardo Bazán. *Professor* JOHNSON.

Three hours. Through the year. Elective for students who have credit for 38, 39, 40. Not offered in 1906-7.

44, 45, 46. *Spanish Classics*
Cervantes, Lope, Calderón, Téllez, and others. *Professor* JOHNSON.

Three hours. Through the year. Elective for students who have credit for 38, 39, 40. *Mon., Wed., Th., at 10.20.*

XXII. SOCIAL AND POLITICAL SCIENCE‡

GEORGE GRAFTON WILSON, PH.D., *Professor of Social and Political Science*

JAMES QUAYLE DEALEY, PH.D., *Professor of Social and Political Science*

LESTER FRANK WARD, LL.D., *Professor of Sociology*

POLITICAL SCIENCE

1. *Political Science, elementary*
Affords a general outline of the subject, and serves as an introduction to the more extended and special courses which follow. *Professor* WILSON.

Three hours. First Term. Sophomore, Junior, or Senior year. Required of candidates for the degree of Bachelor of Arts; elective for others. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Mon., Tu., Th., at 11.20.*

2. *International Relations*
International law, diplomacy, and world-politics. *Professor* WILSON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

3, 4. *American Government*
First Term, constitution, organization, powers, and methods of our national system of government. Second Term, organization and func-

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‡ The courses in this department other than 1 are open only to those students who have credit for Political Science 1, Social Science 1, and Political Economy 1, which together constitute an introduction to the advanced work of the departments of Social and Political Science and Political Economy.

tions of the states and cities of the United States. Followed by 5 in the third term. Course 4 is supplemented by Civil Engineering 16, the course in Municipal Improvements. *Professor* DEALEY.

Three hours. First and Second Terms. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

5. *Comparative Study of Constitutions*

The constitutions of Germany, France, Great Britain, and Switzerland are especially considered. *Professor* DEALEY.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

8. *Constitutional Law*‡

The principles and development of constitutional law, with special reference to the Constitution of the United States. *Professor* DEALEY.

Three hours. First Term. *Tu., Fri., Sat., at 10.20.*

6. *Roman Law*‡

The influence of Roman law on ancient and modern political institutions. *Professor* WILSON.

Three hours. Second Term. *Tu., Fri., Sat., at 10.20.*

7. *Jurisprudence*‡

The fundamental principles of law and legal relations. *Professor* WILSON.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.20.*

9. *The Latin-American Republics*§

The government and social conditions of the Latin-American Republics. *Professor* DEALEY.

Three hours. One Term. Offered if applied for by Graduates.

10. *Political Parties*§

The development of political parties in the United States and Europe. *Professor* WILSON.

Three hours. One Term. Offered if applied for by Graduates.

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‡ Courses 8, 6, and 7 form a continuous course running through the year.

§ Courses 9–15 are primarily for Graduates, and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

11. *Administration*‡

The principles and the chief national systems of administration. *Professor* Wilson.

Three hours. One Term. Offered if applied for by Graduates.

12. *Administration (continued)*‡

Local and colonial administration. *Professor* Wilson.

Three hours. One Term. Offered if applied for by Graduates.

13. *The State*‡

The origin, forms, development, functions, and institutions of the state. *Professor* Dealey.

Three hours. One Term. Offered if applied for by Graduates.

14. *Development of Political Theory*‡

The growth of important political ideas traced from Plato to the present time, with emphasis on the evolution of democracy. *Professor* Dealey.

Three hours. One Term. Offered if applied for by Graduates.

15. *Current Political Theory and Practice*‡

A seminary course. Intended to train students in methods of estimating the value and significance of recent publications on political topics, and the changes consequent upon current political development. *Professors* Wilson *and* Dealey.

One hour. Through the year. Elective for Graduates.

20, 21, 22. *Investigation of Special Topics*

Intended to train the student in methods of gathering, handling, and presenting data in the study of social and political problems. Laboratory methods. *Professors* Wilson *and* Dealey, *Dr.* Kirk.

Three hours. Six hours of attendance. Through the year. Elective for Graduates and for approved Juniors and Seniors.

SOCIAL SCIENCE

1. *Social Science, elementary*

Affords a general outline of the subject, and serves as an introduction to the more extended and special courses which follow. *Professor* DEALEY.

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‡ Courses 9–15 are primarily for Graduates, and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

Three hours. Second Term. Sophomore, Junior, or Senior year. Must be preceded by Political Science 1. Required of candidates for the degree of Bachelor of Arts; elective for others who have credit for Political Science 1. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Mon., Tu., Th., at 11.20.*

2. *Social Institutions, Conditions, and Problems*

Historical development of domestic, religious, and political institutions; study of such social problems as charity, crime, intemperance, marriage, and divorce, etc. *Professors* WILSON *and* DEALEY.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

3. *Origin and Development of Society*

The formation of human institutions and their subsequent modifications. *Professor* WARD.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

4. *Social Philosophy* ‡

The relation of sociology to other sciences, especially its psychic aspects, and the interpretation of social phenomena. *Professor* WARD.

Three hours. First Term. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

5. *Application of Sociological Principles* ‡

The utility of sociology as the basis of legislation and of the social art. The improvement of society through conscious effort. *Professor* WARD.

Three hours. Second and Third Terms. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

6. *Sociological Aspects of Education* §

The social importance of intellectual development and of the diffusion of knowledge. *Professor* WARD.

Three hours. Through the year. Elective for Graduates.

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‡ Courses 4 and 5 form a continuous course running through the year.

§ Courses 6–9 are primarily for Graduates and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

8. *Demography*‡

Dispersion of races; social study of race characteristics; emigration, immigration, etc. *Professor* Wilson.

Three hours. One Term. Offered if applied for by Graduates.

9. *Development of Social Theory*‡

Traces important theories, ancient and modern, in regard to social conditions and development. *Professor* Dealey.

Three hours. One Term. Offered if applied for by Graduates.

7. *Current Social Theory and Practice*‡

A seminary course. *Professors* Wilson *and* Dealey.

One hour. Through the year. Elective for Graduates.

PHYSICAL TRAINING

Frederick William Marvel, Ph.B., *Professor of Physical Training*

From the close of the Thanksgiving recess to the end of the second term, all first and second year students are required to attend gymnasium exercises three times a week as follows:

Freshmen. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Mon., Tu., Th., at 4.20.*

Sophomores. *1st div. Mon., Wed., Th., at 10.20; 2d div. Tu., Th., Fri., at 3.20.*

A voluntary class for Juniors and Seniors will be held on *Mon., Tu., Th., Fri., at 5.20.*

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‡ Courses 6–9 are primarily for Graduates and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

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L. IV JUNE, 1907 NO. 3

BULLETIN
OF
BROWN UNIVERSITY

ANNOUNCEMENT OF COURSES
1907-1908

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WOMEN'S COLLEGE EDITION

PROVIDENCE
PUBLISHED BY THE UNIVERSITY
[APRIL, MAY, JUNE, OCTOBER, DECEMBER, & FEBRUARY]

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ANNOUNCEMENT OF COURSES
OFFERED AT
THE WOMEN'S COLLEGE
IN
BROWN UNIVERSITY
1907-1908

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MAR 24 1931
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PROVIDENCE, RHODE ISLAND
PUBLISHED BY THE UNIVERSITY
1907

GENERAL ANNOUNCEMENTS

FOR

THE ACADEMIC YEAR

1907–1908

∴

THE Academic Year begins with chapel service in Pembroke Hall, at 9 a.m., on Wednesday, September 25.

For information regarding Entrance Examinations, Registration and Enrolment of Undergraduates and Graduates, and Requirements for the various Degrees, see pages 6 to 16 of this Announcement. The following special announcements relate to the Women's College. Undergraduates must register at the Registrar's Office, in Pembroke Hall, between 9 a.m. and 12 m., or between 2 p.m. and 4 p.m., on September 23 and 24. Undergraduates in residence must return their registration cards to the Registrar not later than June 10. Graduate students register at the office of the Registrar of the University.

COURSES OF INSTRUCTION

*A FULL description of each course, with a statement of the conditions of admission to it, may be found on pages 17-85. Courses designated by a † are given at the University, and women are admitted to them, but only on the recommendation of the Dean. Women may also be admitted to other University courses not announced here, with the special permission of the department and with the consent of the Dean. In courses designated by a * a final mark covering the work of the course as a whole will be given at the end of the course, the marks given at the end of the preceding term or terms being regarded as temporary.*

ART

4, 5. *Modern Art*
Professor Poland.
Tu., Wed., Sat., at 9.25.

6. *Theory and Criticism of the Fine Arts*
Professor Poland.
Tu., Wed., Sat., at 9.25.

10. *Freehand Drawing*
Rhode Island School of Design.
Tu., or Th., or Fri., at 2.20.

11. *Practical Work in Art*
Rhode Island School of Design.
Tu., Th., Fri., at 2.20.

ASTRONOMY

1, 2, 3. *General Course*
Professor Upton.
Wed., Fri., Sat., at 11.25.

BIBLICAL LITERATURE AND HISTORY

14, 19, 20. *Later Jewish and Early Christian History and Literature*
Professor Fowler.
Tu., Fri., Sat., at 10.25.

15.† *Biblical Seminary*

BOTANY

1. *Introductory Course*
Professor Collins.
Tu., Wed., Sat., 9.20 to 11.20.
After the first term Botany 1 and Comparative Anatomy 1 are identical.

2.† *Morphology and Physiology*

6.† *Investigation*

CHEMISTRY

1, 2, 3. *Descriptive Chemistry*
Professor Bucher *and Mr.* Dolt.
Mon., Tu., Th., at 11.20.

4, 5.† *Qualitative Analysis*

6.† *Quantitative Analysis*

COMPARATIVE ANATOMY

2.† *Anatomy*

3, 4, 5.† *Bacteriology, General Histology, Special Histology*

7. † *Chemical Physiology*

8.† *Physical Physiology*

10.† *Comparative Embryology*

16.† *Evolution*

18.† *Ornithology*

20. *Household Economics*
The chemistry of foods and their physiological and economic value, with a brief study of dietaries; the principles of general physiology and their application to personal hygiene; sanitation and domestic hygiene and a study of practical plans for household management; inspection of municipal hygiene. *Miss* Wilcox.

Three hours. Six hours of attendance. Through the year. Elective for all Undergraduates. *Mon. 10.20 to 12.20, Th. 11.20 to 1.20, Fri. 2.20 to 4.20.*

22. *General Biology*
Designed as an introduction to the biological sciences and a general culture course. First term: a study of the structure and functions of the different organs of a typical animal, as the cat, with comparisons with human anatomy. Second and third terms: a study of the compound microscope and practice in dissection; a series of typical forms of animal life from the unicellular organisms up to the fern and the frog; general lectures on important biological theories, including evolution,

variation, natural selection, geographical distribution, mutation, etc.
Miss Wilcox.

Three hours. Six hours of attendance. Through the year. Elective for all Undergraduates. *Tu., Wed., Sat., 9.20 to 11.20.*

ECONOMICS

1. *Elementary*
Dr. Kirk.
Third Term. *Tu., Wed., Sat., at 9.25.*

6, 7, 8. *The Labor Movement, Socialism and Industrial Corporations*
Dr. Kirk.
Mon., Th., Fri., at 9.25.

3.† *Money and Banking*

5.† *History and Present Tendencies of Economics*

10, 11, 12.† *Industrial History*

20, 21, 22.† *Investigation of Special Topics*

ENGLISH

1. *Rhetoric and Composition*
Messrs. Hastings, Grose, Boardman, *and* Jones.
Mon., Tu., Th., at 2.25.

3.* *English Composition, advanced course*
Professor Benedict.
Wed., Fri., Sat., at 11.25.

9.† *Old English*

10.† *Chaucer*
Courses 9 and 10 are open to a few selected students.

11. *English Literature from the Beginning to the Present Time*
Professor Benedict.
Mon., Wed., Th., at 10.25.

15. *Shakspere*
Professor Crosby.
Mon., Wed., Th., at 10.25.

16. *English Literature, exclusive of the Drama, from 1600 to 1660*
Professor Bronson.
Mon., Wed., Fri., at 12.25.

17. *English Literature from 1660 to 1798*
Professor Huntington.
Tu., Fri., Sat., at 10.25.

20. *English Literature from 1832 to 1892*
Professor Damon.
Tu., Th., Sat., at 12.25.

GEOLOGY

3.† *General Geology*

12.† *Physical and Commercial Geology*

13.† *Physiographic Seminary*

GERMANIC LANGUAGES AND LITERATURES

1. *Introductory Course*
Mr. Mitchell.
Mon., Wed., Fri., at 12.25.

2. *Intermediate Course*
Professor Jonas.
Mon., Wed., Fri., at 12.25.

3, 4, 5. *Reading Course*
Professors Crowell *and* Jonas.
Tu., Th., Sat., at 12.25.

7. *Advanced Course in Standard Authors, Classical and Modern*
Professor von Klenze.
Mon., Wed., Fri., at 12.25.

10. *Goethe's Faust: Parts I and II*
Professor Crowell.
Mon., Wed., Fri., at 12.25.

17.† *German Mythology*

32.† *Lessing and Schiller*

33, 34, 35.† *Goethe: A Study of His Life and Works*

36.† *Seminary in German Literature*

GREEK LITERATURE AND HISTORY

A, B, C. *Elementary Course*
Mr. ———.
Mon., Tu., Th., at 11.25.

1. *Plato*
Professor Allinson.
Mon., Tu., Th., at 11.25.

2. *Homer*
Professor Manatt.
Mon., Tu., Th., at 11.25.

3. *Sophocles and Herodotus*
Professor Allinson.
Mon., Tu., Th., at 11.25.

5. *Greek Lyric Poets*
Professor Manatt.
Wed., Fri., Sat., at 11.25.

4. *Lucian*
Professor Allinson.
Wed., Fri., Sat., at 11.25.

6. *Dramatic Poets*
Professor Allinson.
Wed., Fri., Sat., at 11.25.

7. *Plato and Aeschylus*
Professor ALLINSON.
Mon., Wed., Th., at 10.25.

11. *Herodotus*
Professor MANATT.
Mon., Wed., Th., at 10.25.

12. *Thucydides*
Professor MANATT.
Mon., Wed., Th., at 10.25.

36. *Introduction to Greek Archaeology*
Professor KING.
Mon., Th., Fri., at 9.25.

HISTORY

1. *Medieval and Modern History of Europe*
Professor MACDONALD.
Mon., Tu., Th., at 11.25.

8, 9, 10. *English Constitutional and Political History to 1689*
Professor MUNRO.
Mon., Tu., Th., at 11.25.

22, 23, 24.† *Seminary in American History*

27, 28, 29. *American History*
Professor MACDONALD.
Tu., Fri., Sat., at 10.25.

INDO-EUROPEAN PHILOLOGY

1. *General Introduction to the Study of Language*
Professor ALLINSON.
Third Term. *Tu., Wed., Sat., at 9.25.*

MATHEMATICS

3. *Algebra*
Professors Manning *and* Slocum.
1st div. Mon., Tu., Th., Fri., at 11.25; 2d div. Tu., Th., Fri., Sat., at 10.25.

1. *Geometry, Solid and Spherical*
Professors Manning *and* Slocum.

2. *Trigonometry*
Professors Manning *and* Slocum.

4. *Analytic Geometry*
Professor Richardson.
First and Second Terms. *Tu., Fri., Sat., at 10.25.*

5. *Differential Calculus*
Professor Richardson.
Tu., Fri., Sat., at 10.25.

6.† *Integral Calculus*

7.† *Applications of the Differential Calculus*

8.† *Applications of the Integral Calculus*

9, 10, 11.† *Differential Equations*

14.† *Solid Analytic Geometry*

PHILOSOPHY

1. *Logic*
Professor Meiklejohn.
Tu., Wed., Sat., at 9.25.

6, 7, 8. *History of Philosophy*
Professor Everett.
Mon., Tu., Th., at 11.25.

11. *Practical Ethics*
President Faunce.
Tu., Wed., Sat., at 10.25.

EDUCATION

Professor Jacobs

1. *History of Education*
Mon., Wed., Th., at 10.25.

2. *Critical Study of Modern Education*
Mon., Wed., Th., at 10.25.

3. *Fundamental Principles of Education*
Mon., Wed., Th., at 10.25.

4. *Psychology of Education*
Mon., Th., Fri., at 9.25.

5. *Hygiene of Education*
Mon., Th., Fri., at 9.25.

6. *Practical Introduction to Teaching*
Mon., Th., Fri., at 9.25.

PHYSICS

1, 2, 3. *Elementary Physics*
Professor Barus.
Wed., Fri., Sat., at 11.25.

4, 5, 6.† *Elementary Physics, continued*

14, 15, 16.† *Advanced Laboratory Course*

17, 18, 19.† *Applied Harmonic Analysis*
or
20, 21, 22.† *Physics, advanced course*

ROMAN LITERATURE AND HISTORY

1. *Livy*
Professor King.
Mon., Th., Fri., at 9.25.

2. *Cicero's Letters*
Professor Harkness.
Mon., Th., Fri., at 9.25.

3. *Tacitus's Germania and Agricola*
Professor Harkness.
Mon., Th., Fri., at 9.25.

4. *Horace's Odes and Epodes*
Professor Green.
Mon., Th., Fri., at 9.25.

34. *Vergil*
Professor King.
Mon., Th., Fri., at 9.25

5. *Catullus, Tibullus, and Propertius*
Professor Green.
Mon., Th., Fri., at 9.25.

7, 8, 9. *Latin Poetry*
Professors Harkness *and* Green.
Tu., Th., Sat., at 12.25.

22, 23, 24.† *Latin Composition*

ROMANCE LANGUAGES AND LITERATURES

1. *Elementary Course*
Professor Morse.
Mon., Wed., Th., at 10.25.

2, 3, 4. *Intermediate Course*
Professor Morse.
Tu., Th., Sat., at 12.25.

5, 6, 7. *French Language and Literature*
Professor Johnson.
Tu., Wed., Sat., at 9.25.

8, 9, 10. *French Literature, exclusive of the Drama, from 1800 to 1850*
Professor Johnson.
Mon., Th., Fri., at 9.25.

14.† *Composition*

20, 21, 22.† *French Literature, exclusive of the Drama, from 1600 to 1800*

23, 24, 25. *The French Drama*
Professor Langdon.
Mon., Th., Fri., at 9.25.

26, 27, 28.† *Modern Italian*

35, 36, 37. *Dante in English*
Professor Langdon.
Wed., Fri., Sat., at 11.25.

38, 39, 40.† *Modern Spanish*

SOCIAL AND POLITICAL SCIENCE

1. *Political Science, elementary*
Professor Wilson.
First Term. *Tu., Wed., Sat., at 9.25.*

1. *Social Science, elementary*
Professor Dealey.
Second Term. *Tu., Wed., Sat., at 9.25.*

2. *Social Institutions, Conditions, and Problems*
Professor Dealey.
Tu., Th., Sat., at 12.25.

PHYSICAL TRAINING

Mrs. Paine

From the close of the Thanksgiving Recess to March 10, all first and second year students are required to attend gymnasium classes three times a week, as follows:

Sophomore Division: *Mon., Tu., Th., 2 to 2.45.*
Freshman Division: *Mon., Tu., Th., 3.20 to 4.05.*

ANNOUNCEMENT OF COURSE
OFFERED IN
BROWN UNIVERSITY

ENTRANCE PRIZES IN GERMAN

The Hermann G. Possner Prizes for Excellence in Preparatory German will be awarded to those members of the Freshman class who upon special examination show the highest excellence in the studies required for admission to the University in German. A first prize of fifteen dollars and a second prize of ten dollars will be awarded. The examination will be held on October 19, 1907.

CHANGE OF RECITATION HOURS

English 19 will be given at 10.20 on Tuesday, Friday, and Saturday.

History 2, 3, 6 will be given at 10.20 on Tuesday, Friday, and Saturday.

PROVIDENCE, RHODE ISLAND
PUBLISHED BY THE UNIVERSITY
1907

PHYSICAL TRAINING

Mrs. PAINE

From the close of the Thanksgiving Recess to March 10, all first and second year students are required to attend gymnasium classes three times a week, as follows:

SOPHOMORE DIVISION: *Mon., Tu., Th., 2 to 2.45.*
FRESHMAN DIVISION: *Mon., Tu., Th., 3.20 to 4.05*

ANNOUNCEMENT OF COURSE
OFFERED IN
BROWN UNIVERSITY
1907–1908

PROVIDENCE, RHODE ISLAND
PUBLISHED BY THE UNIVERSITY
1907

CALENDAR 1907–1908

Vacations and holidays occurring within the academic year 1907–8 are indicated by dark type.

1907

JULY

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

AUG.

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

SEPT.

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

OCT.

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

NOV.

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	**28**	**29**	30

DEC.

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	**23**	**24**	**25**	**26**	**27**	**28**
29	**30**	**31**				

1908

JAN.

S	M	T	W	T	F	S
			1	**2**	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

FEB.

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	**22**
23	24	25	26	27	28	29

MAR.

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	**19**	**20**	**21**
22	**23**	**24**	**25**	26	27	28
29	30	31				

APR.

S	M	T	W	T	F	S
			1	2	3	4
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12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

MAY

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	**30**
31						

JUNE

S	M	T	W	T	F	S
	1	2	3	4	5	6
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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

1908

JULY

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

AUG.

S	M	T	W	T	F	S
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16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

SEPT.

S	M	T	W	T	F	S
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6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

OCT.

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

NOV.

S	M	T	W	T	F	S
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8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

DEC.

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

THE UNIVERSITY CALENDAR 1907–8

1907	
SEPTEMBER 4.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
SEPTEMBER 19–23.	*Thursday, Friday, Saturday, and Monday.* Examinations for admission to the Freshman class and to advanced standing.
SEPTEMBER 24.	*Tuesday.* Last day for registration and enrolment of Undergraduate Students.
SEPTEMBER 25.	*Wednesday.* ACADEMIC YEAR BEGINS (fourth Wednesday in September). Last day for registration of Graduate Students.
OCTOBER 5.	*Saturday.* Examination in Greek for the President's Premiums.
OCTOBER 9.	*Wednesday.* Examination in Latin for the President's Premiums.
OCTOBER 12.	*Saturday.* Examination in Mathematics for the Hartshorn Premiums.
OCTOBER 16.	*Wednesday.* Examination in French for the President's Premiums.
NOVEMBER 28, 29.	*Thursday and Friday.* THANKSGIVING RECESS.
DECEMBER 13–21.	*Friday to Saturday.* Term examinations.
DEC. 23, 1907 to JANUARY 2, 1908.	*Monday to Thursday.* CHRISTMAS RECESS.
1908	
JANUARY 2.	*Thursday.* Last day for enrolment of Undergraduate Students.
JANUARY 3.	*Friday.* SECOND TERM BEGINS.
FEBRUARY 22.	*Saturday.* Washington's Birthday. No University exercises.
MARCH 10–18.	*Tuesday to Wednesday.* Term examinations.
MARCH 19–25.	*Thursday to Wednesday.* SPRING RECESS.
MARCH 25.	*Wednesday.* Last day for enrolment of Undergraduate Students.

March 26.	*Thursday.* Third Term begins.
April 1.	*Wednesday.* Last day for receiving applications for examination for the degree of Doctor of Philosophy, or of Master of Arts *in absentia.*
April 2.	*Thursday.* Last day for receiving essays submitted in competition for the Gaston Prize Medal.
April 30.	*Thursday.* Last day for receiving theses of candidates for the degree of Doctor of Philosophy.
May 1.	*Friday.* Last day for receiving applications for the Grand Army of the Republic Fellowship. Last day for receiving Commencement orations.
May 7.	*Thursday.* Carpenter Prize Speaking Contest.
May 14.	*Thursday.* Gaston Prize Medal Competition.
May 21.	*Thursday.* Hicks Prize Debate.
May 30.	*Saturday.* Memorial Day. No University exercises.
June 1.	*Monday.* Last day for examinations for advanced degrees.
June 4–12.	*Thursday to Friday.* Term examinations.
June 14.	*Sunday.* Baccalaureate Sermon: First Baptist Meeting House, 4.30 p.m.
June 15.	*Monday.* Class Day.
June 16.	*Tuesday.* Annual Meeting of the Phi Beta Kappa Society: Administration Building, 9.30 a.m. Ivy Day: Pembroke Hall. Annual Meeting of the Associated Alumni: Manning Hall, 2.30 p.m. Oration before the Associated Alumni: Sayles Memorial Hall, 4 p.m.
June 17.	*Wednesday.* One Hundred and Fortieth Annual Commencement (third Wednesday in June): First Baptist Meeting House, 10 a.m.
June 18.	*Thursday.* Meeting of the Corporation.
June 18 to Sept. 23.	Summer Vacation.

September 2.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
Sept. 17–21.	*Thursday, Friday, Saturday, and Monday.* Examinations for admission to the Freshman class and to advanced standing.
September 21, 22.	*Monday and Tuesday.* Registration of new students.
September 22.	Enrolment of students previously in residence.
September 23.	*Wednesday.* Academic Year begins (fourth Wednesday in September).

ADMISSION TO THE UNIVERSITY

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ADMISSION TO THE FRESHMAN CLASS

ADMISSION BY EXAMINATION

I. EXAMINATIONS CONDUCTED BY THE UNIVERSITY

EXAMINATIONS for admission to the Freshman class will be held in 1907 on the Thursday, Friday, Saturday, and Monday next following Commencement in June, and also on the Thursday, Friday, Saturday, and Monday next preceding the beginning of the academic year in September. Candidates may be examined in all the subjects in June or in September, or in part in June and in the remainder in September. *After 1907 no June examinations will be offered by Brown University.* See the statement on page 7 relative to the examinations conducted by the College Entrance Examination Board.

Before taking any examination, a candidate must present to the Registrar a letter of recommendation from the principal of his preparatory school and secure a card admitting him to the examination. This may be done by correspondence, provided that the written application and the recommendation are received not less than one week before the first examination held.

If a candidate offers subjects in excess of those required for admission, he may be examined in them at the times scheduled below and receive credit for them as college studies.

The order of the examinations in 1907 will be as follows:

THURSDAY, JUNE 20 and SEPTEMBER 19
Algebra, Wilson Hall 27, 8 a.m. to 10 a.m.
Plane Geometry, Wilson Hall 27, 10 a.m. to 12 m.
Elementary French, Wilson Hall 2, 1 p.m. to 3 p.m.
Advanced French, Wilson Hall 2, 4 p.m. to 6 p.m.

FRIDAY, JUNE 21 and SEPTEMBER 20
Elementary Greek, Wilson Hall 2, 8 a.m. to 10 a.m.
Advanced Greek, Wilson Hall 2, 10 a.m to 11.30 a.m.
Astronomy, Wilson Hall 25, 8 a.m. to 10 a.m.
Physiography, Wilson Hall 25, 10 a.m. to 12 m.
Elementary Latin, Wilson Hall 25, 12.30 p.m. to 2.30 p.m.
Advanced Latin, Wilson Hall 25, 2.30 p.m. to 4 p.m.
English and American History, Wilson Hall 27, 4 p.m. to 6 p.m.

SATURDAY, JUNE 22 and SEPTEMBER 21
English, Wilson Hall 26, 8 a.m. to 10 a.m.
Chemistry, Wilson Hall 2, 11 a.m. to 1 p.m.

Solid Geometry, Wilson Hall 27, 2 p.m. to 4 p.m.
Plane Trigonometry, Wilson Hall 27, 4 p.m. to 6 p.m.

MONDAY, JUNE 24 and SEPTEMBER 23
Elementary German, Wilson Hall 2, 8 a.m to 10 a.m.
Advanced German, Wilson Hall 2, 10 a.m. to 12 m.
Ancient History, Wilson Hall 25, 1 p.m. to 3 p.m.
Physics, Wilson Hall 1, 4 p.m. to 6 p.m.

In addition to the entrance examinations in June and September, another series of entrance examinations will be given at the close of the Christmas recess. These are open only to students already pursuing courses in the university. Students desiring to take these examinations must file written applications with the Registrar before December 1. No student who has failed in an entrance examination will be granted another examination at any time other than June or September, except on presentation of a tutor's certificate that he is prepared for such examination and after payment of a fee of two dollars.

No entrance examinations other than those regularly appointed will be held unless ordered by vote of the Committee on Registration and Attendance. For such examinations a fee of two dollars is charged.

II. EXAMINATIONS CONDUCTED BY THE COLLEGE ENTRANCE EXAMINATION BOARD

Examinations conducted under the supervision of the College Entrance Examination Board will be accepted in place of the corresponding examinations conducted by Brown University. In 1907 these examinations will be held June 17–22.

All applications for such examinations must be addressed to the Secretary of the College Entrance Examination Board, Post Office Sub-Station 84, New York, and must be made upon a blank form to be obtained from the Secretary of the Board upon application. Applications for examination at points in the United States east of the Mississippi River, also at Minneapolis, St. Louis, and other points on the Mississippi River, must be received by the Secretary of the Board on or before Monday, June 3, 1907 ; applications for examination elsewhere in the United States or in Canada must be received on or before Monday, May 27, 1907 ; and applications for examination at points outside the United States and Canada must be received on or before Monday, May 13, 1907. Applications received later than the dates named will be accepted when it is possible to arrange for the examinations of the candidates concerned, but only upon the payment of $5.00 in addition to the regular fee.

The examination fee is $5.00 for all candidates examined at points in the United States and Canada, and $15.00 for all candidates examined at points outside of the United States and Canada. The fee (which cannot be accepted in advance of the application) should be remitted by postal order, express order, or draft on New York, to the order of the College Entrance Examination Board.

A list of the places at which examinations are to be held by the Board in June is published about March 1. To receive proper consideration, requests that the examinations be held at particular points should be transmitted to the Secretary of the Board not later than February 1.

REGISTRATION AND ENROLMENT OF UNDERGRADUATES

REGISTRATION

In September of each year all *new students*, whether candidates for a degree or special students, must report at the Administration Building between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first term, and fill out registration cards for the whole of the ensuing year. Failure to comply with this rule will be treated as late registration and a fee of three dollars charged. All new students must present at or before the time of registration all credentials necessary for admission either as candidates for a degree or as special students.

In May of each year all *Undergraduates in residence*, whether candidates for a degree or special students, must obtain at the Registrar's office registration cards for the next year; these cards must be filled out by the students themselves with a statement of the courses elected for the whole of the ensuing year, and returned not later than June 1. Failure to comply with this rule will be treated as late registration and a fee of three dollars charged.

Courses bearing a single number must be elected as a whole. When term courses are grouped in one paragraph (*e. g.* Astronomy 1, 2, 3), the second term may not be taken without the first, nor the third without the second, unless specific statement to the contrary is made. In starred courses a final mark covering the work of the course as a whole will be given at the end of the course, the marks given at the end of the preceding term or terms being regarded as temporary. Changes in registration will be allowed only on presentation of sufficient reasons to the Committee on Registration and Attendance. Requests for permission to make changes in September must be presented to the Committee between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first term. Requests for permission to make changes for the second or third term must be presented to the Committee before the beginning of the examinations of the first and second terms respectively, unless the requests be the result of failure in those examinations, in which case they must be presented in writing to the Registrar two days before the opening of the second and third terms respectively.

ENROLMENT

In September all students whose registration cards have been already approved must report at the Registrar's office between 10 a.m. and 5 p.m. on the day preceding the opening of the first term and have their names checked as enrolled for the term. Failure to report will be treated as late enrolment and a fee of three dollars charged.

At the beginning of the second and third terms all Undergraduates must report at the Registrar's office between 10 a.m. and 5 p.m. on the day preceding the opening of the term and have their names checked as enrolled for the term. Failure to report will be treated as late enrolment and a fee of three dollars charged.

GRADUATE STUDENTS

Graduate students will report to the Dean of the Graduate Department in No. 5 Wilson Hall between 9 a.m. and 1 p.m. or between 3 and 5 p.m. on the Monday or Tuesday preceding the opening of the first term.

GUARANTEE

Every student, with the exceptions noted below, must present at or before his registration for the first term of the year the following guarantee, properly signed and witnessed. The guarantor must be the parent or guardian, or some other responsible person.

In consideration of the admission of
as a student in Brown University, I hereby guarantee and promise to pay to said University all dues for rent, tuition, and incidental and other expenses properly chargeable to said as such student, as and when the same shall respectively become payable.

A student paying the full room charges for the year at or before his registration for the first term, and the tuition and other charges for each term at or before his registration for that term, will not be required to present a guarantee.

NOTES

When the time of recitation is not given in connection with the announcement of the courses, the hours will be arranged with the instructors at the beginning of the term.

Members of the Senior Class who are candidates for the degree of Bachelor of Science in Civil Engineering are required to hand the subjects of their theses to the Professor of Civil Engineering on or before October 31, 1907.

Students desiring to rent rooms or to obtain room-mates should apply to the Registrar.

For official notices students should consult the bulletin boards in the north corridor of University Hall or in the Administration Building.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ARTS

I. PRESCRIBED SUBJECTS

ANCIENT Languages (either Latin or Greek, or both). Six hours. At least three hours must be taken in the Freshman year, and the whole six hours must be completed by the end of the Sophomore year.

Modern Languages (either French or German, or both). Six hours. At least three hours must be taken in the Freshman year, and the whole six hours must be completed by the end of the Sophomore year.

Students presenting German only must take elementary French. Students presenting French only must take elementary German. Students presenting elementary French only must continue French in the Freshman year and take elementary German in either the Freshman or the Sophomore year. Students presenting elementary German only must continue German in the Freshman year and take elementary French in either the Freshman or the Sophomore year. Students presenting elementary French and elementary German only must continue both languages, but may postpone the continuation of one language to the Sophomore year. Students presenting elementary work in one language and elementary and advanced work in the other must take in the Freshman year the language in which the elementary work only was presented. Students presenting elementary and advanced work in both languages may take the required six hours in either French or German, or both.

Mathematics. Four or five hours. Freshman year. Four hours for students not presenting Solid Geometry and Plane Trigonometry. Five hours for students presenting Solid Geometry and Plane Trigonometry.

English. Rhetoric and Composition. Three hours. Freshman year.

European History. Three hours. Sophomore or Junior year.

English Literature. Any one of the courses in English from 10 to 23 inclusive. Sophomore, Junior, or Senior year.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Political Science, Social Science, and Political Economy. One three-hour, one-term course in each of the three departments. Sophomore, Junior, or Senior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year. The courses in Education cannot be taken to satisfy this requirement.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. *Required Studies.*

Latin 1, 2, 3 or *Greek* 1, 2, 3. Three hours.

French 1 or 2, 3, 4 or *German* 1 or 2. } Three hours.

Mathematics 3, 1, 2. Four hours; or

Mathematics 4, 5; 15, 16. Five hours.

English 1. Three hours.

II. *Elective Studies.*

One three-hour course running through the year must be chosen from the following list:

Latin 1, 2, 3. For students presenting elementary and advanced Latin for admission.

Greek A, B, C. For students not presenting Greek for admission.

Greek 1, 2, 3. For students presenting elementary and advanced Greek for admission.

French 1. For students not presenting French for admission.

French 2, 3, 4. For students presenting elementary French for admission.

French 5, 6, 7. For students presenting advanced French for admission.

German 1. For students not presenting German for admission.

German 2. For students presenting elementary German for admission.

German 7. For students presenting advanced German for admission.

Greek 34, *Latin* 30, *Indo-European Philology* 1. (*Greek and Roman Literature and the History of Language.*) For all students.

Chemistry 1, 2, 3. For all students.

Chemistry 4, 5, 6. For students presenting Chemistry for admission. (Subject to the consent of the department.)

Botany 1 or *Comparative Anatomy* 1. For all students.

SOPHOMORE YEAR

I. That portion of the required work in ancient and modern languages not completed in the Freshman year.

II. Other required and elective courses sufficient with those taken under I to make fifteen hours a week.

JUNIOR YEAR

I. The required History and Physical or Natural Science, if not previously taken.

II. Other required and elective courses sufficient with those taken under I to make fifteen hours a week.

SENIOR YEAR

I. All required courses not previously taken.

II. Elective courses sufficient with those taken under I to make fifteen hours a week.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF PHILOSOPHY

I. PRESCRIBED SUBJECTS

Modern Languages. An amount sufficient with the work presented for admission to complete the elementary course and a year of advanced work in both French and German. A student who is admitted in both advanced French and advanced German is required to continue one of these languages for one year, three hours a week.

Mathematics. Four or five hours. Freshman year. Four hours for students not presenting Solid Geometry and Plane Trigonometry. Five hours for students presenting Solid Geometry and Plane Trigonometry.

English. Rhetoric and Composition. Three hours. Freshman year.

European History. Three hours. Sophomore or Junior year.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year. The courses in Education cannot be taken to satisfy this requirement.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. *Required Studies.*
  English 1. Three hours.
  French 1 or 2, 3, 4 or } Three hours.
  German 1 or 2. }
  Mathematics 3, 1, 2. Four hours; or
  Mathematics 4, 5; 15, 16. Five hours.

II. *Elective Studies.*
  Two three-hour courses running through the year must be chosen from the following list:
  Latin 1, 2, 3. For students presenting elementary and advanced Latin for admission.
  Greek A, B, C. For students not presenting Greek for admission.
  Greek 1, 2, 3. For students presenting elementary and advanced Greek for admission.
  French 1. For students not presenting French for admission.
  French 2, 3, 4. For students presenting elementary French for admission.
  French 5, 6, 7. For students presenting advanced French for admission.
  German 1. For students not presenting German for admission.
  German 2. For students presenting elementary German for admission.

German 7. For students presenting advanced German for admission.

Greek 34, *Latin* 30, *Indo-European Philology* 1. (*Greek and Roman Literature and the History of Language.*) For all students.

Chemistry 1, 2, 3. For all students.

Chemistry 4, 5, 6. For students presenting Chemistry for admission. (Subject to the consent of the department.)

Botany 1 or *Comparative Anatomy* 1. For all students.

Mechanical Drawing 2, 3. For all students.

SOPHOMORE YEAR

I. That portion of the required work in modern languages not completed in the Freshman year.

II. Other required and elective courses sufficient with those taken under I to make fifteen hours a week.

JUNIOR YEAR

I. The required History and Physical or Natural Science, if not previously taken.

II. Other required and elective courses sufficient with those taken under I to make fifteen hours a week.

SENIOR YEAR

I. All required courses not previously taken.

II. Elective courses sufficient with those taken under I to make fifteen hours a week.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN CIVIL ENGINEERING

FRESHMAN YEAR

First Term	*Second Term*	*Third Term*
Mathematics 17	Mathematics 18	Mathematics 19
Mech. Drawing 1	Mech. Drawing 1	Mech. Drawing 1
Civil Engineering 1	Civil Engineering 2	Civil Engineering 3
English 1	English 1	English 1
French 2 or German 2	French 3 or German 2	French 4 or German 2

SOPHOMORE YEAR

Mathematics 20	Mathematics 21	Mathematics 21
Civil Engineering 4	Civil Engineering 5	Civil Engineering 6
Physics 1	Physics 2	Physics 3

SOPHOMORE YEAR

First Term	*Second Term*	*Third Term*
‡Political Science 1	‡Social Science 1	‡Economics 1
	Civil Engineering 7	§Civil Engineering 8
	Civil Engineering 9	Civil Engineering 10

Also, of the following courses, the subject not presented for admission:

Chemistry 1	Chemistry 2	Chemistry 3
French 1	French 1	French 1
German 1	German 1	German 1

JUNIOR YEAR

Civil Engineering 11	Civil Engineering 12	Civil Engineering 15
Mechanics 1	Mechanics 1	Mechanics 3
Astronomy 4	Astronomy 5	Astronomy 6
Physics 7	Physics 7	Physics 7
Elect. Engineering 1	Elect. Engineering 2	Geology 16
Geology 17	Civil Engineering 14	

SENIOR YEAR

Civil Engineering 23	Civil Engineering 24	Civil Engineering 17
Civil Engineering 25	Civil Engineering 29	Civil Engineering 18
Civil Engineering 26	Civil Engineering 27	Civil Engineering 28
Civil Engineering 35	Civil Engineering 35	Civil Engineering 35
Mech. Engineering 22	Mech. Engineering 22	Civil Engineering 19
Mechanics 2	Mechanics 2	Civil Engineering 32
Civil Engineering 13	Civil Engineering 30	Civil Engineering 34
	Civil Engineering 31	

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

FRESHMAN YEAR

First Term	*Second Term*	*Third Term*
Mathematics 17	Mathematics 18	Mathematics 19
Mech. Drawing 1	Mech. Drawing 1	Mech. Drawing 1
Civil Engineering 1	Civil Engineering 2	Civil Engineering 3
English 1	English 1	English 1
French 2 or German 2	French 3 or German 2	French 4 or German 2

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‡ Or some other three-term course, in the Department of English, or History, or Philosophy, chosen with the approval of the head of the Department of Civil Engineering.

§ Civil Engineering 8 is taken during the spring recess.

SOPHOMORE YEAR

First Term	*Second Term*	*Third Term*
Mathematics 20	Mathematics 21	Mathematics 21
Mech. Drawing 4	Mech. Drawing 5	Mech. Engineering 8
Physics 1	Physics 2	Physics 3
‡Political Science 1	‡Social Science 1	‡Economics 1
	Mech. Engineering 1	Mech. Engineering 3

Also, of the following courses, the subject not presented for admission:

Chemistry 1	Chemistry 2	Chemistry 3
French 1	French 1	French 1
German 1	German 1	German 1

JUNIOR YEAR

Mechanics 1	Mechanics 1	Mechanics 3
Mech. Engineering 4	Mech. Engineering 5	
Mech. Engineering 9	Mech. Engineering 10	Mech. Engineering 11
Physics 7	Physics 7	Physics 7
Elect. Engineering 1	Elect. Engineering 2	Elect. Engineering 3
Elect. Engineering 7	Elect. Engineering 8	Elect. Engineering 9

SENIOR YEAR

Mechanics 2	Mechanics 2	Civil Engineering 17
Mathematics 9	Elect. Engineering 11	Physics 19
Elect. Engineering 4	Elect. Engineering 5	Elect. Engineering 6
Physics 23	Physics 23	Physics 23
Elect. Engineering 10	Elect. Engineering 12	Elect. Engineering 13
		Civil Engineering 32
Elect. Engineering 14	Elect. Engineering 14	Elect. Engineering 14

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

FRESHMAN YEAR

First Term	*Second Term*	*Third Term*
Mathematics 17	Mathematics 18	Mathematics 19
Mech. Drawing 1	Mech. Drawing 1	Mech. Drawing 1
Civil Engineering 1	Civil Engineering 2	Civil Engineering 3
English 1	English 1	English 1
French 2 or German 2	French 3 or German 2	French 4 or German 2

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‡ Or some other course, not technical, chosen with the approval of the head of the Department of Electrical Engineering.

SOPHOMORE YEAR

First Term	*Second Term*	*Third Term*
Mathematics 20	Mathematics 21	Mathematics 21
Mech. Drawing 4	Mech. Drawing 5	Mech. Engineering 8
Physics 1	Physics 2	Physics 3
‡Political Science 1	‡Social Science 1	‡Economics 1
	Mech. Engineering 1	Mech. Engineering 2

Also, of the following courses, the subject not presented for admission:

Chemistry 1	Chemistry 2	Chemistry 3
French 1	French 1	French 1
German 1	German 1	German 1

JUNIOR YEAR

Mech. Engineering 19	Mech. Engineering 20	Mech. Engineering 21
Mech. Engineering 16	Mech. Engineering 17	Mech. Engineering 18
Mech. Engineering 3	Mech. Engineering 4	
Mech. Engineering 9	Mech. Engineering 10	Mech. Engineering 11
Mechanics 1	Mechanics 1	Mechanics 3
Physics 7	Physics 7	Physics 7

SENIOR YEAR

Mech. Engineering 22	Mech. Engineering 22	
Mech. Engineering 5	Mech. Engineering 6	
Mech. Engineering 12	Mech. Engineering 13	Mech. Engineering 14
Mechanics 2	Mechanics 2	Mech. Engineering 15
Elect. Engineering 1	Elect. Engineering 2	Elect. Engineering 3
Mech. Engineering 23	Mech. Engineering 24	Civil Engineering 32
Mech. Engineering 25	Mech. Engineering 25	Mech. Engineering 25

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‡ Or some other course, not technical, chosen with the approval of the head of the Department of Mechanical Engineering.

COURSES OF INSTRUCTION

*IN every department courses bearing a single number must be elected as a whole. When term courses are grouped in one paragraph (*e.g. *Astronomy 1, 2, 3), the second term may not be taken without the first, nor the third without the second, unless specific statement to the contrary is made. In starred courses a final mark covering the work of the course as a whole will be given at the end of the course, the marks given at the end of the preceding term or terms being regarded as temporary. When the time of meeting is not announced it will be arranged with the instructor at the beginning of the term.*

I. ART

William Carey Poland, A.M., Litt. D., *Professor of the History of Art*

1, 2, 3. *History of Art from Antiquity through the Renaissance*

First term, ancient art; a general course in the history of ancient art, chiefly Greek. Second term, Roman, early Christian, and Medieval art; a study of Roman, Romanesque, and Gothic art, with some notice of Byzantine, Arabian, and Oriental art. Third term, art of the Renaissance; the fifteenth and sixteenth centuries; the effect on art of the dominant motives of the epoch, the development of art in the different countries of Europe, the great masters and their most significant works. Text-book, lectures, lantern views.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Wed., Th., at 10.20.*

4, 5. *Modern Art*

First term, the seventeenth and eighteenth centuries. Second term, the nineteenth century. Text-book, lectures, special assigned topics, lantern views.

Three hours. First and Second Terms. Elective for Juniors, Seniors, and Graduates, who have credit for 3. *Tu., Th., Sat., at 12.20.*

6. *Theory and Criticism of the Fine Arts*

A study of the more important facts and laws of artistic production. Text-book, special assigned topics, illustrated lectures.

Three hours. Third Term. Elective for students who have credit for any course in Art. *Tu., Th., Sat., at 12.20.*

[7. *Seminary in Classical Architecture*]

Critical study; reading of Vitruvius in Latin; discussion of the principles followed by the Greek and Roman architects, and of the influence of Vitruvius upon the Renaissance.

Three hours. Second and Third Terms. Elective for Graduates. Not offered in 1907–8.

[8. *Seminary in Greek and Roman Sculpture*]

An archaeological course based on Overbeck's *Schriftquellen*.

Three hours. Through the year. Elective for Graduates who read Greek and Latin. Not offered in 1907–8.

[9. *Seminary Study of the Acropolis of Athens*]

Critical reading, in the Greek, of Pausanias's account of the Acropolis of Athens; lectures and illustrations.

Three hours. First Term. Elective for Graduates who read Greek and Latin. Not offered in 1907–8.

10. *Freehand Drawing*

Training of hand and eye by progressive study of models of machine parts, casts of ornamental forms, and still-life objects.

One hour. Two hours of drawing. Through the year. Elective for all students. Given at the Rhode Island School of Design. *Tu., or Th., or Fri., at 2.20.*

11. *Practical Work in Art*

Six hours of drawing or other practical work. To illustrate the principles of delineation, color, and chiaroscuro, and the principles of design in architecture, sculpture, and painting, as exemplified in the historic forms of art.

Three hours. Through the year. Elective for students who have credit for 10, and who have taken or are taking 1, 2, 3. Given at the Rhode Island School of Design. *Tu., Th., Fri., at 2.20.*

12. *Seminary in Renaissance Art*

Critical study of the art of the fifteenth and sixteenth centuries, particularly Italian. A more detailed study of the spiritual conditions, the influences, and the masters, than in 3.

Three hours. Through the year. Elective for Graduates who have credit for 3. Offered only if three or more elect the course. It is advised that applications be made early to Professor Poland.

II. ASTRONOMY

WINSLOW UPTON, A.M., SC.D., *Professor of Astronomy*
FREDERICK SLOCUM, PH.D., *Assistant Professor of Astronomy*

1, 2, 3. *General Course*

Fundamental conceptions of the science; methods of professional study; present state of our knowledge of the heavenly bodies. Young's *Manual of Astronomy;* lectures and abstracts upon assigned topics. Designed either for purposes of general culture or as a preparation for technical work. *Professor* UPTON.

Three hours. Through the year. Elective for Juniors and Seniors who have credit for Mathematics 3, 1, 2. *Tu., Th., Fri., at 3.20.*

4, 5, 6. *Geodetic Astronomy*

Application of astronomy to geodesy; the problems of time, latitude, longitude, and azimuth. Computations and observations. *Professor* UPTON.

Three hours. Through the year. Required of Engineering students. Elective for Juniors and Seniors who have credit for Mathematics 3, 1, 2. May be taken at the same time as 1, 2, 3. *Mon., Tu., Th., at 2.20.*

7, 8, 9. *Nautical Astronomy*

Principles of navigation; methods of determining the position of a ship at sea; use of sextant, compass, and chart for determining latitude, longitude, bearings, and courses. *Professor* SLOCUM.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for Mathematics 3, 1, 2. May be taken at the same time as 1, 2, 3. Not elective for students who have taken or are taking 4, 5, 6. *Mon., Wed., Th., at 10.20.*

10, 11, 12. *Practical Astronomy*

Advanced study of geodetic applications of astronomy; method of least squares. Doolittle's *Practical Astronomy,* with instrumental observations. *Professor* UPTON.

Three hours. Through the year. Elective for Graduates, and for Undergraduates who have shown special aptitude for instrumental observations.

13, 14, 15. *Special Advanced Work*

Subjects selected to meet the requirements of individual students. *Professor* UPTON.

Three hours. Through the year. Elective for Graduates.

III. BIBLICAL LITERATURE AND HISTORY ‡

HENRY THATCHER FOWLER, PH.D., *Professor of Biblical Literature and History*

HENRY ENGLANDER, A.M., *Assistant in Biblical Literature and History*

1. *Elementary Hebrew*

Grammar; exercises in writing Hebrew; translation of parts of Genesis and Deuteronomy. *Professor* FOWLER *and Mr.* ENGLANDER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

2. *Historical Hebrew*

Reading of the books of Samuel and Kings with special attention to the acquisition of a vocabulary; review of the elements of Hebrew grammar and study of syntax. *Professor* FOWLER *and Mr.* ENGLANDER.

Three hours. Through the year. Elective for students who have credit for 1.

3. *Hebrew Literature*

Wisdom literature. Critical translation of the wisdom books of the Old Testament and investigation of the nature and growth of the speculative thought of ancient Israel. In succeeding years corresponding courses in the Legal, Prophetic, and Psalm literature of the Old Testament will be offered. *Professor* FOWLER.

Three hours. Through the year. Elective for Graduates and approved Undergraduates.

4. *Textual Criticism of the Old Testament*

The principles and method of textual criticism, in connection with the study of one of the shorter prophetical books. *Mr.* ENGLANDER.

Three hours. One term. Offered if applied for by Graduates.

5. *Biblical Aramaic*

Grammar and reading of the Aramaic portions of the Old Testament. *Mr.* ENGLANDER.

Three hours. One term. Offered if applied for by students who have credit for 1.

6. *Elementary Arabic*

Grammar; exercises in writing Arabic; translation of prose selections. *Professor* FOWLER.

Two hours. Through the year. Elective for Seniors and Graduates.

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‡ For conditions under which students may receive credit in the Newton Theological Institution for work done in this department, see the Catalogue under Arrangements with Other Institutions.

7, 8, 9. *Gospels and Epistles*

Characteristics of Hellenistic Greek; translation, and investigation of date, authorship, and thought. First term, the Johannine writings. Second term, the Gospel of Mark and the First Epistle of Peter. Third term, the Gospels of Matthew and Luke. If desired by the class, translation from the writings of Justin Martyr may be substituted for the specified reading of the second term. First and third terms, *Professor* FOWLER. Second term, *Professor* ALLINSON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Tu., Th., at 2.20.*

[10, 11, 12. *Acts and Pauline Epistles*]

First term, Acts. Second term, Thessalonians and Galatians. Third term, Corinthians and Romans. *Professors* ALLINSON *and* FOWLER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. Not offered in 1907–8.

[13, 17, 18. *Hebrew and Early Jewish History and Literature*]

First term, early Semitic history, the formative age of Hebrew history, and Hebrew literature before the Monarchy. Second term, history and literature of the Hebrew Monarchy. Third term, Jewish history and literature from the Captivity to the Maccabean Revolt. Includes nearly the entire Old Testament history and literature. In connection with 14, 19, 20, gives a comprehensive view of Biblical history and literature. The Biblical books are read in the best English translations; no knowledge of the original languages is required. *Professor* FOWLER.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Not offered in 1907–8.

14, 19, 20. *Later Jewish and Early Christian History and Literature*

First term, the Maccabean and Roman ages of Jewish history and literature. Second term, the four Gospels and the life of Christ. Third term, the Acts, Epistles, Apocalypse, and the history of the Apostolic age. Includes a large part of the Jewish writings from the second century B.C. to the fall of Jerusalem, and the entire New Testament history and literature, studied in its Jewish setting. In connection with 13, 17, 18, gives a comprehensive view of Biblical history and literature. The books are read in the best English translations; no knowledge of the original languages is required. *Professor* Fowler.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Wed., Th., at 10.20.*

15.* *Biblical Seminary*

Subject for 1907–8: Critical investigation of the sources for the life of Christ. *Professor* Fowler.

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors.

[16. *Principles of Historical Criticism and Research*]

This course is the same as the first term of course 25 offered by the Department of History. *Professor* MacDonald.

One hour. First Term. Elective for Graduates of one year's standing. Required of all candidates for the degree of Doctor of Philosophy in Biblical Literature and History. Not offered in 1907–8.

IV. BOTANY ‡

James Franklin Collins, Ph.B., *Assistant Professor of Botany*

1. *Introductory Course*

Introductory to other courses in the department; also designed for those who, without intending to pursue the subject further, desire a general view of biological work and biological theories. Aims to give an introduction to laboratory methods of dissection and experiment and the use of the microscope, to afford a general view of the structure and functions of plants and animals, and to present an outline of the more important biological theories, such as evolution, natural selection, variation, mutation, and heredity. After the first term Botany 1 and Comparative Anatomy 1 are identical and the classes are combined.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. *Mon., Tu., Th., 2.20 to 4.20.*

2.* *Morphology and Physiology*

Minute structure and special functions of plants, plant cells, and tissues; embryology; glycerin and paraffin technic, etc. The work of the third term is arranged to meet the more special needs of students intending to take up either medicine or forestry. Certain portions of this course may, with the approval of the instructor, be continued by Juniors, Seniors, and Graduates, in course 6.

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‡ Students intending to teach or to apply for positions in the Government or State experiment station service are advised to supplement courses 1, 2, and 3, 4, 5 with advanced or special work in course 6.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for 1, and for approved Graduates. Not to be offered in 1908–9. Alternates with 3, 4, 5. *Mon., Wed., Fri., at 12.20.*

[3, 4, 5. *Cryptogams*]

Structure, development, physiology, embryology, classification, etc. First term, lower fungi and algae. Second term, higher fungi and fungal diseases of crops and trees. Third term, hepatics, mosses, ferns, and their allies. Intended to give a general view of the evolution of the cryptogams and of the life-history of certain types. Special stress is laid upon fungal diseases and upon the methods of investigating and experimenting with little known or unknown diseases. Certain portions of this course may, with the approval of the instructor, be continued by Juniors, Seniors, and Graduates, in course 6.

Three hours. Six hours of attendance. Through the year. Course 3 is elective for Sophomores, Juniors, and Seniors, who have credit for 1, and for approved Graduates. Courses 4 and 5 are each elective for those who have credit for 3. Not offered in 1907–8. To be offered in 1908-9. Alternates with 2.

6.* *Investigation*

The character of the problems varies, and the course may therefore be taken two or more years in succession. Students electing this course must, so far as possible, definitely arrange the work and the time schedule with the instructor before June 1 of the preceding academic year. Special work upon almost any phase of botany may be chosen if approved by the instructor.

One to three hours. Through the year. Two to six hours of attendance for qualified Juniors and Seniors. Primarily for Graduates, who may, with the approval of the instructor, elect the course for more than three hours.

7. *Trees*

Lectures, field study, and identification of trees; economic value of wood, etc. Primarily a field course with lectures or laboratory work during the early part of the term. No previous knowledge of botany required.

One hour. Two hours of attendance. Third Term. Elective for Undergraduates.

V. CHEMISTRY

John Howard Appleton, A.M., Sc.D., *Newport-Rogers Professor of Chemistry*

John Emery Bucher, Ph.D., *Associate Professor of Organic Chemistry*

Maurice Louis Dolt, Ph.B., *Instructor in Chemistry*

Frederick George Keyes, Sc.B., *Assistant in Chemistry*

Walter Clifton Slade, *Assistant in Chemistry*

1, 2, 3. *Descriptive Chemistry*

Non-metals; metals, their metallurgy, compounds, and practical applications; theoretical chemistry. Lectures with experiments; written exercises; individual laboratory work. *Professor* Bucher, *Messrs.* Dolt, Keyes, *and* Slade.

Three hours. Through the year. Elective for Undergraduates. *1st div. Mon., Th., at 10.20; 2d div. Tu., Fri., at 10.20; 3d div. Wed., Sat., at 11.20.* Laboratory hours to be arranged with the instructor.

4, 5. *Qualitative Analysis*

First term, properties of the metallic elements; their separation from certain of their compounds. Laboratory work; recitations in qualitative analysis and in chemical philosophy; exercises in stoichiometry. Second term, the principal non-metals and the acids formed by them; methods of separation and recognition of acids and acid radicles. *Professor* Appleton *and Mr.* Gager.

Three hours. Six hours of attendance. First and Second Terms. Elective for Juniors who have credit for 1, 2, 3. *1st div. Fri. at 11.20; 2d div. Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

6. *Quantitative Analysis*

Quantitative precipitations and separations of the most important elements and compounds; the principles upon which quantitative apparatus is constructed; chemical philosophy and stoichiometry continued. Chiefly laboratory work. *Professor* Appleton *and Mr.* Gager.

Three hours. Six hours of attendance. Third Term. Elective for Juniors who have credit for 4, 5. *1st div. Fri. at 11.20; 2d div. Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

7, 8, 9. *Quantitative Analysis, advanced course*

Assaying of metallic ores; analysis of agricultural materials; testing of chemicals used in textile establishments, etc. *Professor* APPLETON *and Mr.* GAGER.

Six hours. Twelve hours of attendance. Through the year. Elective for Seniors and Graduates who have credit for 6. Laboratory hours to be arranged with the instructor.

10, 11, 12. *Organic Chemistry*

Preparation and analysis of representative organic compounds. Lectures, recitations, and laboratory work. *Professor* BUCHER *and Mr.* DOLT.

Six hours. Through the year. First and Second Terms, three lectures a week and three laboratory periods a week. Elective for approved Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

13. *Assaying*

Professor APPLETON *and Mr.* GAGER.

Six hours. Twelve hours of attendance. Third Term. Elective for Seniors and Graduates who have credit for 1–6.

14. *Dyeing of Cotton, Wool, and Silk*

The preparation and use of mordants, dyestuffs, etc. *Professor* APPLETON *and Mr.* GAGER.

Six hours. Twelve hours of attendance. Third Term. Elective for approved Seniors and Graduates.

15, 16, 17. *Industrial Chemistry*

Lectures and laboratory work. *Professor* APPLETON.

Three to six hours. Six to twelve hours of attendance. Through the year. Elective for approved Graduates. Each term may be elected independently.

18, 19, 20. *Physical Chemistry*

Lectures and laboratory work. *Professor* BUCHER.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

[21, 22. *Organic Chemistry, advanced course*]

Professor BUCHER.

Three hours. First and Second Terms. Elective for approved Graduates. Not offered in 1907–8.

[23. *Inorganic Chemistry, advanced course*]

Professor BUCHER.

Three hours. Third Term. Elective for approved Juniors, Seniors, and Graduates. Not offered in 1907–8.

24, 25, 26. *Organic Preparations, advanced course*
Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

27, 28, 29. *Inorganic Preparations, advanced course*
Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates, who have credit for 10, 11, 12.

30, 31, 32. *Research Work in Chemistry*
Professor Bucher.

Three hours, or more. Through the year. Elective for Graduates.

33, 34, 35. *Conference on Special Topics in Chemistry*
Professor Bucher.

One hour. Through the year. Elective for approved students.

36, 37, 38. *Conference on Special Topics in Chemistry*
Professor Appleton.

One hour. Through the year. Elective for approved students.

VI. CIVIL ENGINEERING ‡

John Edward Hill, C.E.M., Sc.D., *Professor of Civil Engineering*
Arthur Horace Blanchard, C.E., A.M., *Associate Professor of Civil Engineering*
Oscar William Rackle, Sc.B. in C.E., *Assistant in Civil Engineering*
Everett Harold Swett, Ph.B., *Assistant in Civil Engineering*

1, 2, 3. *Lettering*

Practice in simple lettering as a preparation for work in the drafting room. *Professor* Hill.

One hour. Two hours of drafting. Through the year. Not elective. *1st div. Tu. 2.20 to 4.20; 2d div. Fri. 2.20 to 4.20.* Second term, *3d div. Wed. 2.20 to 4.20.*

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‡ All courses in this department except 16 are required of candidates for the degree of Bachelor of Science in Civil Engineering: all except 1, 2, 3, and 32 and 35 are elective for other students.

4, 5, 6. *Surveying, elementary course*

Theory and practice of plane surveying; use of tape, compass, level, and transit; adjustment of instruments. Lectures, recitations, field work, and drafting. *Professors* HILL *and* BLANCHARD, *Messrs.* RACKLE *and* SWETT.

Three hours. One hour of recitation first and third terms, and usually six hours of field work or drafting. Through the year. Elective for students who have credit for Mathematics 3, 1, 2, and for Mechanical Drawing 1 or 2. *Tu. at 11.20; Mon., Th., 2 to 5.*

7. *Topographical Drawing*

Pen and colored topography; hill shading by different methods, contour drawing, topographic map-making, conventional signs for structural materials. *Professor* BLANCHARD *and Mr.* RACKLE.

Three hours. Six hours of drafting. Second Term. Elective for Juniors and Seniors who have credit for Drawing 1 or 2. *Wed., Fri., 2 to 5.*

8, 9. *Surveying, advanced course*

Topography and hydrography; city surveying; use of stadia, plane table, sextant, and barometer; precise base-line measurements with steel tape. Methods as in 4, 5, 6. *Professors* HILL *and* BLANCHARD, *Messrs.* RACKLE *and* SWETT.

Three hours and one hour. Second Term. Course 8 is taken during the spring recess. Elective for students who have credit for 4. *Tu. at 11.20.*

10, 11, 12, 13. *Railroad Engineering*

Theory, location, construction, and economics of railroad engineering. Lectures, recitations, field work, and drafting. Third term, railroad curves and practical problems. First term, actual location of a line about two miles long, map, and estimate of cost. Second term, railroad track and track work, ties, ballast, rails, frogs, switches, etc.; maintenance of way department; methods of work. First term, earthwork and its cost; rock excavation; tunneling; economics of location. *Professor* HILL *and Messrs.* RACKLE *and* SWETT.

Three, four (eight hours of field work), three, and three hours. Third, First, Second, and First Terms. Elective for students who have credit for 6 and 9. Third term, *Tu., Wed., Fri., at 8.* First term, *Wed. 8 to 5.* Second term, *Tu., Wed., Fri., at 9.20.* First term, *Tu., Fri., at 1.20; Sat. 9.20 to 11.20.*

14. *Hydraulic Engineering* ‡

Consideration of water supply mainly from a sanitary standpoint. A general course designed to give the chemical and biological aspects of water supply without laboratory work. Lectures, recitations, and seminary work. *Professor* HILL.

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‡ Courses 14, 17, and 18 cover the general subject of sanitation.

Three hours. Second Term. Elective for Juniors and Seniors. *Tu., Wed., Fri., at 10.20.*

15. *Geodesy*

Problems in geodetic surveying, with sufficient theory for a proper understanding of the formulae used. Lectures and computations. *Professor* HILL *and Mr.* SWETT.

Three hours. One hour of recitation and five hours of computation. Third Term. Elective for students who have credit for 6 and 9, and Astronomy 5. *Th. at 10.20; Fri. 2.20 to 5.20; Sat. 9.20 to 11.20.*

16. *Municipal Improvements*

Economic and social aspects of sewerage, water works, pavements, etc. *Professor* HILL.

Three hours. First Term. Elective for Juniors and Seniors. Offered only if ten or more elect the course. *Mon., Th., Fri., at 9.20.*

17. *Hydraulic Engineering* ‡

Supplements Mechanics 2, which gives the theoretical treatment of the subject. Consideration of water supply mainly from an engineering standpoint. Irrigation, pumps, and pumping machinery; construction of dams and reservoirs. Lectures, recitations, and seminary work. *Professor* HILL.

Three hours. Third Term. Elective for students who have credit for Mathematics 6, Mechanics 2, and Mechanical Drawing 1. *Mon., Wed., Fri., at 9.20.*

18. *Sanitary Engineering* ‡

Sewerage and house drainage; theory of sewerage, with occasional problems in design; treatment and disposal of sewage; stream pollution; appliances used in construction and maintenance; amount and velocity of flow; house drainage and its appliances; garbage collection and disposal. Lectures, recitations, and seminary work. *Professor* HILL.

Three hours. Third Term. Elective for students who have credit for Mathematics 6, Mechanics 2, and Mechanical Drawing 1. *Mon., Wed., Fri., at 11.20.*

19. *Highway Engineering*

Economics and location of country roads; surveys, grades, drainage, and foundations; construction of roads of earth, gravel, and broken stone; economics and design of street pavements of asphalt, brick, cobble-stone, stone-block, and wood-block; methods of testing road materials; roads and pavements in foreign countries. Lectures, recitations, inspection trips, and seminary work. *Professor* BLANCHARD.

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‡ Courses 14, 17, and 18 cover the general subject of sanitation.

Three hours. Third Term. Elective for Sophomores, Juniors, and Seniors. *Mon., Tu., Th., at 8.*

[20, 21, 22. *Laboratory Investigations*] ‡

Use and adjustment of instruments; testing materials; stereotomy. *Professor* HILL.

Three hours. Through the year. Elective for students who have credit for Mathematics 6, Mechanics 1, and Mechanical Drawing 1. Not offered in 1907–8.

23. *Simple Framed Structures*

The standard forms of simple roof trusses; calculation by analytical methods of stresses due to dead, snow, and wind loads; calculation by analytical methods of stresses in Pratt, Howe, Warren, and parabolic trusses due to dead, wind, uniform live, excess panel live, and locomotive wheel loads; miscellaneous trusses, skew bridges, influence lines, cranes, trussed bents, and towers. Lectures, recitations, and seminary work. *Professor* BLANCHARD.

Three hours. First Term. Elective for students who have credit for Mathematics 6, Mechanics 1, and Mechanical Drawing 1 or 2. *Mon., Tu., Th., at 9.20.*

24. *Higher Framed Structures*

General analysis of continuous, movable, cantilever, and suspension bridges and three-hinged, two-hinged, and fixed-end arched ribs; calculations of stresses in continuous and non-continuous center-bearing swing bridges; theorem of three moments; deflection of framed structures; theorem of least work. Lectures, recitations, and seminary work. *Professor* BLANCHARD.

One hour. Second Term. Elective for students who have credit for 23 and are taking 30. *Mon. at 9.20.*

25. *Structural Details*

Riveted joints, roof details, tension members, combined direct and bending stresses, secondary stresses, columns under direct and eccentric loading; details of wooden structures; plate girder, parabolic highway, pin-connected, and riveted Pratt truss railroad bridges; construction of viaducts and elevated railroads; steel mill-building and high-building construction; comparison of standard structural specifications. Lectures, recitations, and computations. *Professor* BLANCHARD.

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‡ In 1907–8 students in Civil Engineering will take Mechanical Engineering 22 in place of Civil Engineering 20 and 21.

Three hours. First Term. Elective for students who have taken or are taking 23. *Mon., Tu., Th., at 8.*

26. *Roof Design and Graphic Statics*

Graphic determination of center of gravity and moment of inertia of combinations of structural shapes; determination by graphical methods of moments in beams and stresses in simple roof trusses; determination of shears, moments, and stresses in simply supported bridge trusses by the use of influence lines; complete design, with shop drawings, of a fifty to seventy foot roof truss; revision and discussion of checked drawings; drawing and computations; inspection trips. *Professor* BLANCHARD *and Messrs.* RACKLE *and* SWETT.

Three hours. One hour of recitation and four hours of drafting. First Term. Elective for students who are taking 23 and 25. *Tu. at 10.20; Mon., Th., 10.20 to 12.20; Wed. 2 to 5.*

27, 28. *Bridge Design*

Determination of stresses in plate girder and trussed bridges by the use of moment and shear diagrams; detail design, with shop drawings, of a plate girder highway bridge; detail design, with shop drawings, of a Pratt truss railroad bridge; general class design of a wooden Howe truss electric railway bridge. Lectures on American and English shop practice; the esthetic design of bridges, design of standpipes and elevated tanks, and American methods of erection of bridges and structures. Lectures, drawing, computations, inspection trips, and seminary work. *Professor* BLANCHARD *and Messrs.* RACKLE *and* SWETT.

Three and three hours. Six and six hours of drafting. Second and Third Terms. Elective for students who have taken 23, 25, 26, and are taking 29 and 30. Second term, *Tu., Th., 1.20 to 4.20.* Third term, *Tu. 10.20 to 12.20 and 1.20 to 4.20; Th. at 10.20.*

29. *Reinforced Concrete Structures*

Properties of reinforced concrete; theory and design of reinforced concrete arches in accordance with the elastic theory; theory and design of reinforced concrete beams, retaining walls, dams, foundations, bridges, and culverts; systems of reinforcement; methods of construction;

complete design, with shop drawings, of a fifty-foot reinforced concrete highway arch bridge. Lectures, recitations, drafting, and computations. *Professor* BLANCHARD *and Messrs.* RACKLE *and* SWETT.

Four hours. Two hours of recitation and four hours of drafting. Second Term. Elective for students who have taken 23 and 25 and are taking 27 and 30. *Mon., Th., at 8; Tu., Th., 10.20 to 12.20.*

30. *Masonry Structures*

Stone masonry; static and elastic theory of the masonry arch; design of a stone arch; theory and design of masonry piers, of retaining walls, bridge abutments, and of earth and high masonry dams; complete design, with drawings, of a high masonry dam. Lectures, recitations, drafting, and computations. *Professor* BLANCHARD *and Messrs.* RACKLE *and* SWETT.

Two hours. One hour of recitation and two hours of drafting. Second Term. Elective for students who are taking 24, 27, and 29. *Tu. at 8; Mon. 10.20 to 12.20.*

31. *Foundations*

Soundings and borings, foundation-beds, deposition of concrete under water, timber foundations, coffer dams, open caissons, Cushing cylinder piers, pile formulae, driving and foundations, pneumatic caissons of wood and steel, open dredging, the Poetsch freezing process, foundations in quicksand, foundations for high buildings. Lectures, recitations, and seminary work. *Professor* BLANCHARD.

Two hours. Second Term. Elective for students who have credit for Mechanics 1 or 3. *Tu., Th., at 9.20.*

32. *Engineering Jurisprudence*

Essential elements of a contract, the parties to a contract, considerations, bids and bidders, work for private parties and public work. Employment of engineers, liability of the engineer as a professional man; when his functions are judicial; when he is a public officer. Real property, water rights, ownership, rights of way, boundaries, incorporeal rights, and franchises. Engineering specifications and accompanying documents. Lectures and discussion of written decisions on typical cases assigned each week. *Professor* BLANCHARD.

Two hours. Third Term. Required of candidates for the degree of Bachelor of Science. *Tu., Th., at 9.20.*

34. *Design of Sanitary Works*

Practical applications of the principles of design discussed in courses 17 and 18. Partial design of a sewerage system, water-works system, and filter plant. *Professor* Hill.

One hour. Two hours of drafting and computations. Third Term. Elective for students who have taken or are taking 17 and 18. *Th. at 11.20.*

35. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Civil Engineering. The thesis must embody either a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

VII. COMPARATIVE ANATOMY

Albert Davis Mead, Ph.D., *Professor of Comparative Anatomy*
Frederic Poole Gorham, A.M., *Associate Professor of Biology*
Herbert Eugene Walter, Ph.D., *Assistant Professor of Comparative Anatomy*
Philip Henry Mitchell, Ph.D., *Instructor in Physiology*
Frank Taylor Fulton, Sc.B., M.D., *Instructor in Pathology and Histology*
Jay Perkins, M.D., *Demonstrator in Anatomy*

1. *Introductory Course*

Introductory to all other courses in the department; also designed for those who, without intending to pursue the subject further, desire a general view of biological work and biological theories. Aims to give an introduction to laboratory methods of dissection and experiment and the use of the microscope, to afford a general view of the structure and functions of animals and plants, and to present an outline of the more important biological theories, such as evolution, natural selection, variation, mutation, and heredity. After the first term Comparative Anatomy 1 and Botany 1 are identical and the classes are combined. *Professor* Gorham.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. *Mon., Tu., Th., 2.20 to 4.20.*

2. *Anatomy*

Includes the study of each organ from its primitive form in the lowest animals to its most complex form in the higher animals and in man. Aims to give a thorough knowledge of the structure and meaning of each organ of the animal body. Designed for students of biology and of medicine. Students are permitted to attend clinics and autopsies at the Rhode Island Hospital. Laboratory work and lectures. *Professor* WALTER.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1.

3. *Bacteriology*

The methods of studying bacteria; the preparation of culture media; isolation, systematic study, and determination of unknown species; qualitative and quantitative biological examination of water, milk, air, and soil; methods of determining pathogenic properties of bacteria; methods of sterilization and disinfection; special work on pathogenic forms. *Professor* GORHAM.

Three hours. Six hours of attendance. Third Term. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon., Wed., Th., at 10.20.*

4. *General Histology*

The technic of preparing animal tissues for microscopical examination. The structure of the fundamental tissues. Special histology of the sense organs. *Professor* MEAD.

Three hours. Six hours of attendance. First Term. Elective for Juniors and Seniors who have credit for 1, and for Sophomores who have credit for 1 and who are not taking any other course in the department.

5. *Special Histology*

The specific microscopical structure of the organs of the body and of the blood. The relation of structure to normal physiological activity and the relation of certain diseases to changes in cellular structure. *Dr.* FULTON.

Three hours. Six hours of attendance. Second Term. Elective for Juniors and Seniors who have credit for 4, and for Sophomores who have credit for 4 and who are not taking any other course in the department.

7. *Chemical Physiology*

The chemistry of the proteids, carbohydrates, and fats; of salivary, gastric, and pancreatic digestion; of the blood, bile, and urine; the analysis of milk and of water; toxicology. *Dr.* MITCHELL.

Three hours. Six hours of attendance. First and Second Terms. Must be preceded by Chemistry 2. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Tu., Fri., Sat., at 10.20.*

8. *Physical Physiology*

The physiology of muscle and nerve; the physics and physiology of the circulatory, respiratory, and alimentary systems; the causes and theories of sleep; the physiology of the special senses. *Dr.* MITCHELL.

Three hours. Six hours of attendance. Third Term. Must be preceded by 7. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Tu., Fri., Sat., at 10.20.*

[9. *Anatomy of the Nervous System*]

The gross anatomy and the microscopic structure of the nervous system in vertebrates, especially in man; phylogeny, embryology, and physiology of the nervous system. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1. Not offered in 1907–8. To be offered in 1908–9.

10. *Comparative Embryology*

Laboratory work. Principles of embryological development and of heredity, illustrated by the fertilization and cleavage of the egg, metamorphosis, and organ formation. Special attention given to the origin and development of the human body. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1. Not to be offered in 1908–9.

11. *Biological Theories and Biological Problems*

Seminary course. *Professor* MEAD.

One to three hours. Through the year. Elective for Graduates.

12. *Bacteriology, advanced course*

Laboratory work and seminary. *Professor* GORHAM.

Three to twelve hours. Through the year. Elective for Juniors and Seniors who have credit for 3, and for Graduates.

13. *Physiology, advanced course*

Laboratory work and seminary. *Dr.* MITCHELL.

Three to twelve hours. Through the year. Elective for Graduates who have sufficient knowledge of chemistry and physiology.

14. *Human Anatomy*

Laboratory instruction. A course in practical dissection. Students also have an opportunity to attend certain operations at the hospital and to be present at autopsies. *Dr.* PERKINS.

Three hours. Through the year. Elective for Graduates.

15. *Special Advanced Work*

Research work arranged to meet the requirements of individual students. *Professor* MEAD.

Three to twelve hours. Through the year. Elective for Graduates.

16. *Evolution*

The history of biology, principles of classification, geographical distribution, heredity, natural selection, variation, Mendelism, and the relationship of man to the lower animals. Lectures and assigned reading. *Professor* MEAD.

Three hours. Third Term. Elective for Juniors and Seniors.

18. *Ornithology*

A study of birds regarded as a group of living animals in relation to their environment. Lectures and field identification of wild birds during their spring migration. *Professor* WALTER.

One hour. Two hours of attendance. Third Term. Elective for Undergraduates.

VIII. ECONOMICS‡

HENRY BRAYTON GARDNER, PH.D., *Professor of Political Economy*
WILLIAM KIRK, PH.D., *Instructor in Political Economy*

1. *Economics, elementary*

Affords a general outline of the subject, and serves as an introduction to the more extended and special courses which follow. *Professor* GARDNER.

Three hours. Second Term. Sophomore, Junior, or Senior year. Must be preceded by Political Science 1. Required of candidates for the degree of Bachelor of Arts; elective for others who have credit for Political Science 1. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Mon., Wed., Fri., at 12.20.*

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‡ The courses in this department other than 1 are open only to those students who have credit for Political Science 1, Economics 1, and Social Science 1, which together constitute an introduction to the advanced work of the departments of Social and Political Science and Economics.

2.* *General Economics*

The development and significance of the more important elements in the existing industrial organization; the principles governing the production, exchange, distribution, and consumption of wealth; the more important practical problems of economic life. First and third terms, *Professor* Gardner. Second term, *Dr.* Kirk.

Three hours. Through the year. Elective for Juniors and Seniors. *Tu.*, *Fri.*, *Sat.*, *at 10.20.*

3. *Money and Banking*

Principles of money and banking; recent monetary and banking history, particularly of the United States; monetary and banking systems of leading industrial nations; present monetary and banking problems. *Professor* Gardner.

Three hours. First and Second Terms. Elective for Juniors, Seniors, and Graduates. Not to be offered in 1908–9. *Wed.*, *Fri.*, *Sat.*, *at 11.20.*

[4. *Public Finance*]

First term, general principles of public finance; revenues and expenditures of leading industrial nations. Second term, financial history of the United States. Third term, local finance: revenues, expenditures, and financial systems of American states and cities. *Professor* Gardner.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Not offered in 1907–8. To be offered in 1908–9.

5. *History and Present Tendencies of Economics*

Early economic theories: a critical examination of the theories of the early schools of economists, especially the physiocrats and the early English school, with particular attention to the relation between economic thought and economic life and practice. Recent economic theories: a study of the tendencies of the historical school, the Austrian school, and recent English and American writers. The growth of the principle of monopoly, its influence on the production and distribution of wealth and on the economic well-being of society. *Professor* Gardner *and Dr.* Kirk.

Three hours. One session of an hour and a half weekly. Through the year. Elective for Seniors and Graduates who have credit for 2.

6. *The Labor Movement*

History and analysis of the trade-union movement; growth of collective bargaining; labor problems in the United States. *Dr.* KIRK.

Three hours. First Term. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

7. *Socialism*

A brief review of the historically important socialistic schemes; mainly a study of the modern scientific socialism of Karl Marx and of the resulting socialistic movements. *Dr.* KIRK.

Three hours. Second Term. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

8. *Industrial Corporations*

Development of the corporate form of business organization; its effects; the problems to which it gives rise. Special emphasis on the recent movements toward combination, and toward state control of corporations, particularly quasi-public corporations. *Professor* GARDNER.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. Not to be offered in 1908–9. *Wed., Fri., Sat., at 11.20.*

[9. *The Tariff*]

The arguments for free trade and protection in relation to the principles of international trade; the history of tariff legislation and its effects in the United States. *Dr.* KIRK.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. Not offered in 1907–8. To be offered in 1908–9.

10, 11, 12. *Industrial History*

First term, the chief stages in the development of the industrial life of England, with special emphasis on the origin and development of the existing form of industrial organization. Second term, the more important aspects of the industrial development of the colonies and the United States to 1860. Third term, the growth, organization, and geographical distribution of the main branches of industry since 1860; the relation of the industrial life of the United States to that of the world at large. *Professor* GARDNER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. *Tu., Th., Sat., at 12.20.*

13. *Physical and Commercial Geography*

A study of the physical features of the land; of climate, winds, ocean currents; of the geographical distribution of food-stuffs and raw materials of industry; and of the consequent development of commerce and of civilization in its economic aspects. Lectures and laboratory work. This course is the same as Geology 12. *Professor* BROWN *and Dr.* KIRK.

Three hours. Through the year. Elective for Juniors and Seniors. *Wed., Th., at 10.20; Fri. 2.20 to 4.20.*

20, 21, 22. *Investigation of Special Topics*

Intended to train the student in methods of gathering, handling, and presenting data in the study of economic life and problems. Laboratory methods. *Professor* GARDNER *and Dr.* KIRK.

Three hours. Six hours of attendance. Through the year. Elective for approved Juniors, Seniors, and Graduates. Each term may be elected independently.

IX. ENGLISH ‡

WALTER COCHRANE BRONSON, A.M., LITT.D., *Professor of English Literature*

LINDSAY TODD DAMON, A.B., *Professor of Rhetoric*

ALBERT KNIGHT POTTER,† A.M., *Associate Professor of the English Language*

GEORGE WYLLYS BENEDICT, PH.D., *Associate Professor of English*

THOMAS CROSBY, A.M., *Assistant Professor of English and Public Speaking*

HENRY BARRETT HUNTINGTON, A.B., *Assistant Professor of English*

WILLIAM THOMSON HASTINGS, A.M., *Instructor in English*

WALTER CLARKE PHILLIPS, A.M., *Instructor in English*

HOWARD BRISTOL GROSE, JR., PH.B., *Instructor in English*

______________________, *Assistant in English*

______________________, *Assistant in English*

1. *Rhetoric and Composition*

Lectures and recitations upon the fundamental laws of style, with special emphasis upon usage; prescribed reading and themes. Designed to give the student a clear and correct style and some critical standards. *Professors* Damon *and* Huntington, *Messrs.* Hastings, Phillips, Grose, ——, *and* ——.

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‡ Credit for English 1 is a prerequisite for admission to all other courses in English. The requirement in English Literature for the degree of Bachelor of Arts may be satisfied by taking any one of the courses from 10 to 23 inclusive.

† On leave of absence during the academic year 1907-8.

Three hours. Through the year. Required of all Freshmen. *1st, 2d, and 3d div. Fri. at 12.20; Mon., Th., at 11.20. 4th, 5th, and 6th div. Mon., Wed., Fri., at 12.20.*

2.* *English Composition, second course*

Lectures, recitations, and prescribed reading; fortnightly themes and other written exercises. Intended to supplement the training given in 1, and to develop further the power of exact and lucid statement. *Mr.* Hastings.

Three hours. Through the year. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

3.* *English Composition, advanced course*

Frequent practice in composition and criticism. Intended to develop ease of style and clarity and vigor of thought. *Professor* Damon.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores who have attained the grade of C in 1. With the consent of the instructor the course may be repeated. *Mon., Wed., Th., at 10.20.*

4. *Argumentative Composition*

Lectures on the principles and forms of argumentative composition; frequent practice in brief-drawing and the writing of forensics and less formal arguments. Intended to develop the power of handling argumentative topics cogently and persuasively. *Professor* Huntington.

Three hours. Through the year. Elective for Juniors and Seniors. *Mon., Wed., Th., at 10.20.*

5. *Argumentative Composition*

The principles and forms of brief-drawing and forensic writing. Lectures, written exercises, briefs, and forensics. Intended to furnish a more rapid training than 4, for students who wish to begin debate as early as possible or to go quickly over the fundamentals of argumentative composition. *Professor* Huntington.

Three hours. Two hours of attendance. First Term. Elective for Juniors and Seniors. Not elective for students who have taken 4. *Mon. at 3.20; Fri. at 2.20.*

6.* *Debate*

Intended to train students in correct and vigorous oral presentation of ideas. *Professor* Huntington, *with the coöperation of the Professors* *of Economics, Social and Political Science, History, and Public Speaking.* Three hours. Second and Third Terms. Elective for a limited number of Juniors and Seniors who have credit for 5 or for one or more terms of 4. With the consent of the instructor, the course may be repeated. *Mon. 3.20 to 5.20; Fri. 2.20 to 4.20.*

7.* *Public Speaking*

Principles of voice culture; vocal interpretation of literature; extempore speaking. *Professor* CROSBY.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Wed., Fri., Sat., at 11.20.*

[8. *Public Speaking, advanced course*]

Reading the Bible, liturgy, and hymns. *Professor* CROSBY.

One hour. Two hours of class-room work. First Term. Elective for a limited number of Seniors. Not offered in 1907-8.

[24. *Public Speaking, advanced course*]

The occasional address. Practice in the composition and delivery of the more common forms of public discourse, with some attention to voice culture. *Professor* CROSBY.

Three hours. Through the year. Elective for a limited number of Juniors and Seniors who have credit for 7. Not offered in 1907-8.

9. *Old English*

Essentials of Anglo-Saxon grammar; prose selections; Béowulf. *Professor* BENEDICT.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 3.20.*

10. *Chaucer*

Careful reading of most of Chaucer's works; study of Middle English grammar, with some attention to the development of Modern English. *Professor* BENEDICT.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 4.20.*

11. *English Literature from the Beginning to the Present Time*

An outline course in the history of English literature, with reading and study of the greater writers. *Professor* BRONSON.

Three hours. Through the year. Elective for Sophomores. *Tu., Th., Sat., at 12.20.*

[12. *English Literature, exclusive of the Drama, from 1400 to 1600*]

Medieval literary forms and the transition to the modern period: romance, ballad, allegory, satire, Elizabethan novels and lyrics. *Professor* BENEDICT.

Three hours. Through the year. Elective for students who have credit for 10 and one other of the courses from 9 to 23 inclusive. Not offered in 1907–8.

[13. *History of the Drama in England*]

The drama as a literary type, and its history in England to 1642. *Professor* POTTER.

Three hours. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. Not offered in 1907–8.

18. *The English Drama*

The history of the English drama from Marlowe to the present time, with reading and study of the greater playwrights. *Mr.* GROSE.

Three hours. Through the year. Elective for Juniors and Seniors. Not to be offered in 1908–9. *Mon., Tu., Th., at 11.20.*

[14. *Shakspere*]

Careful study of a few plays, with special attention to exact interpretation. *Professor* POTTER.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Not offered in 1907–8.

15. *Shakspere*

Shakspere as dramatist and poet; reading of all the plays. *Professor* CROSBY.

Three hours. Through the year. Elective for Juniors and Seniors. *Tu., Th., Sat., at 12.20.*

16. *English Literature, exclusive of the Drama, from 1600 to 1660*

The decline of the Elizabethan spirit; Puritanism and Anglicanism in literature; the "metaphysical" and mystical poets; the cavalier lyrists; all the English poems and some of the prose works of Milton. *Professor* BRONSON.

Three hours. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. Not to be offered in 1908–9. *Mon., Tu., Th., at 3.20.*

[17. *English Literature from 1660 to 1798*]

The Restoration drama; the classical school; development of the essay and the novel; the beginnings of romanticism. *Professor* Bronson.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. Not offered in 1907-8.

19. *English Literature from 1798 to 1832*

The romantic revolt in its critical and imaginative phases; influence of the French revolution; individualism in form and spirit. *Mr.* Hastings.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon., Wed., Th., at 10.20.*

20. *English Literature from 1832 to 1892*

The Victorian period; modifications of romanticism in prose and poetry; realism; influence of science and democracy; tendencies at the end of the century. *Professor* Damon.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for Sophomores, Juniors, and Seniors. *Wed., Fri., Sat., at 11.20.*

[21. *Victorian Poets*]

A detailed study of Tennyson, Browning, Arnold, Clough, Rossetti, Morris, and Swinburne. *Professor* Crosby.

Three hours. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. Not offered in 1907-8.

50. *The Modern Novel*

A study of the currents of modern life and thought as expressed in some of the best novels of the nineteenth century. Forms with French 50 and German 50 a continuous study of some of the chief phases of European literature since Shakspere. *Professor* Damon.

Three hours. Third Term. Elective for Sophomores and Juniors who have taken French 50 and German 50. *Tu., Wed., Sat., at 9.20.*

22. *American Literature*

American literature from the beginning, in its relation to American life and to English literature. *Professor* Bronson.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for one of the following courses: 11, 19, 20. Not to be offered in 1908–9. *Mon., Th., Fri., at 4.20.*

23. *Seminary in English Literature*

Subject for 1907–8: Studies in medieval romance and allegory. *Professor* Benedict.

Three hours. Two hours of attendance. Through the year. Elective for Graduates, and for a limited number of Seniors who have attained the grade of C in two of the courses from 9 to 22 inclusive.

X. GEOLOGY ‡

Charles Wilson Brown, A.M., *Assistant Professor of Geology*

3. *General Geology*

A discussion of the origin, weathering, and metamorphism of rocks; of other agencies that have affected the formation and development of the earth and its crust; of certain land-forms and the stages of their development; a review of earth changes, with special reference to the development of the North American continent; the types of life characteristic of the different periods, and the principles of organic evolution they illustrate. Lectures illustrated by models and lantern views. One-third of the time will be devoted to laboratory work during a portion of the first term. Two field trips will be taken in the first term, and three in the third term.

Three hours. Through the year. Elective for Sophomores who do not elect 1, and for Juniors and Seniors. *Tu., Fri., Sat., at 10.20.*

6. *Dynamical and Structural Geology*

An advanced course dealing with sedimentary formations, old and new; with folds, faults, mountain-making, and other characteristics of crustal movements; and the nature and results of igneous and metamorphic activities.

Three hours. One term. Offered if applied for. Elective for students who have credit for 3 or 16.

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‡ Students who wish a general view of the geologic processes concerned in the development of the earth and its life, should take course 3. Those who contemplate teaching physical geography should take also courses 10, 11, 12, 9, and 8. Students who desire to specialize in geology or geography, in order to teach or to obtain appointment on Government or State geological surveys, are advised to elect first the work in mineralogy and to follow it with courses 3, 11, 4, 9, 8, 6, and 10 or 12, approximately in the order given.

1. *Mineralogy*

Crystallography. The more common minerals; their recognition and determination; their occurrence in rocks; the physical properties of minerals; blowpipe analysis. Lectures and laboratory work.

Three hours. Through the year. Elective for Sophomores who do not elect 3, and for Juniors and Seniors. *Tu. at 11.20; Th. 2.20 to 4.20.* Two laboratory hours to be arranged with the instructor. Not to be offered in 1908–9. Alternates with 4.

[4. *Petrography*]

A study of the optical properties of minerals; determination of minerals and rocks by means of the petrographic microscope; a discussion of the fundamental principles of the origin and classification of rocks. Lectures and laboratory work.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have taken or are taking 3. Students intending to take this course are advised to take Physics 5 in preparation. Two laboratory hours to be arranged with the instructor. Not offered in 1907–8. Alternates with 1.

9, 8, 11. *Field Geology*

Geological maps, their use and methods of construction; practice in the actual working out of the surface geology and stratigraphy of an assigned definite area. Reports and thesis.

Three hours. Through the year. One conference hour to be arranged with the instructor and the equivalent of six hours' work in the field-area. Elective for Juniors, Seniors, and Graduates. The first term may be taken independently and is elective for students who have credit for 3 or 16; the first and second terms may be elected as a two-term course; the third term may be elected separately by students who are taking 3 or 16.

17. *Lithology*

Determination of the common rock-forming minerals and the simpler types of rocks; building stones, their distribution, weathering qualities, and methods of preservation.

Two hours. Four hours of attendance. First Term. Required in the Junior year of candidates for the degree of Bachelor of Science in Civil Engineering. Not elective. *Tu. 9.20 to 11.20; Fri. 10.20 to 12.20.*

16. *Engineering Geology*

Lectures; laboratory and field work. The course includes five field trips, and each student is required to take detailed field notes of the regions visited.

Three hours. Third Term. Required in the Junior year of candidates for the degree of Bachelor of Science in Civil Engineering. Not elective. *Mon., Wed., Fri., at 10.20.*

[10. *Physiography*]

The ocean; the atmosphere; land forms, their classification, origin, growth, decay, and geographical distribution. With special reference to the influence of physiography upon the economic development of the United States. Lectures and laboratory work.

Three hours. Through the year. Elective for Juniors and Seniors. Not offered in 1907-8.

12. *Physical and Commercial Geography*

A study of the physical features of the land; of climate, winds, ocean currents; of the geographical distribution of food-stuffs and raw materials of industry; and of the consequent development of commerce and of civilization in its economic aspects. Lectures and laboratory work. This course is the same as Economics 13. *Professor* BROWN *and Dr.* KIRK.

Three hours. Through the year. Elective for Juniors and Seniors. *Wed., Th., at 10.20; Fri. 2.20 to 4.20.*

13. *Physiographic Seminary*

Discussions and reports on the more advanced problems of Physiography.

Three hours. One hour of attendance. Through the year, or, by special arrangement with the instructor, the course may be taken for a shorter period. Elective for Graduates, for Undergraduates who have passed the first term's work in course 12, and for others who have had sufficient preliminary training in Physiography.

14. *Geologic Investigation*

Research work in the field and the laboratory, arranged to meet the needs of individual students.

Through the year, or, by special arrangement with the instructor, the course may be taken for a shorter period. Elective for qualified Graduates and for one to six hours for approved Undergraduates.

XI. GERMANIC LANGUAGES AND LITERATURES

CAMILLO VON KLENZE, PH.D., *Professor of the Germanic Languages and Literatures*

ASA CLINTON CROWELL, PH.D., *Associate Professor of the Germanic Languages and Literatures*

JOHANNES BENONI EDUARD JONAS, PH.D., *Assistant Professor of the Germanic Languages and Literatures*

ROBERT MCBURNEY MITCHELL, A.B., *Instructor in German*

1. *Introductory Course*

Reading, grammar, composition, conversation, dictation, sight reading. *Professor* CROWELL *and Mr.* MITCHELL.

Three hours. Through the year. Required of all students who did not present German for admission. *1st div. Tu., Wed., Sat., at 9.20; 2d div. Mon., Th., Fri., at 9.20; 3d div. Tu., Th., Sat., at 12.20; 4th div. Mon., Tu., Th., at 2.20.*

2. *Intermediate Course*

Reading of modern German stories (Batt and Allen's *German Stories,* volumes 1 and 2), lyrics (von Klenze or Hatfield), and one or two dramas of the classical period. Review of grammar; composition; conversation based upon the texts read. *Professor* JONAS *and Mr.* MITCHELL.

Three hours. Through the year. Required of all Freshmen who presented elementary German for admission. Not elective for students who have taken German in college. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Fri., Sat., at 10.20.*

3, 4, 5. *Reading Course*

Reading of modern German stories (Batt and Allen's *German Stories,* volume 2) and lyrics (von Klenze or Hatfield), and two dramas illustrating respectively the classical and the modern period: Schiller's *Maria Stuart* and Hebbel's *Agnes Bernauer.* Review of grammar; composition; conversation based upon the texts read. *Professors* VON KLENZE *and* CROWELL.

Three hours. Through the year. Elective for students who have credit for 1. *1st div. Mon., Wed., Th., at 10.20; 2d div., Wed., Fri., Sat., at 11.20.*

6. *Modern Prose*

Aims to train the student in reading, speaking, writing, and understanding modern German. Reading of texts selected from fiction, history, and science (Liliencron, Keller, Freytag, Helmholtz, etc.), and a text to introduce the student to the actual language of modern daily life, such as Mosher's *Willkommen in Deutschland.* Talks in German; oral and written reports in German; letter-writing, composition, and conversation. *Professor* JONAS.

Three hours. Through the year. Elective for students who have credit for 1 or 2, and for students who presented advanced German for admission. *Tu., Fri., Sat., at 10.20.*

7. *Advanced Course in Standard Authors, Classical and Modern*

One drama of Goethe, Grillparzer's *Hero und Leander,* Hebbel's *Herodes und Mariamne,* Keller's *Romeo und Julie auf dem Dorfe,* Sudermann's *Frau Sorge.* Talks in German on the story of German literature; oral and written reports in German. *Professor* JONAS.

Three hours. Through the year. Elective for students who have credit for 2, and for students who presented advanced German for admission. *Mon., Tu., Th., at 11.20.*

23, 24, 25. *German Lyrical Poetry*

Introduces the student to the various aspects of the inner life of the German people as reflected in the lyrical poetry of the last two centuries. Lectures in German; oral and written reports in German. *Professor* JONAS.

Three hours. Through the year. Elective for students who have credit for 5 or 7, or who presented advanced German for admission; also for other approved students. Each term may be elected independently. *Mon., Wed., Th., at 10.20.*

[26, 27, 28. *The German Short Story*]

Kleist, Ludwig, Storm, C. F. Meyer, Keller, Rosegger. A study of the origin of the short story and its development in the nineteenth century, with frequent reference to its chief representatives in France, England, and America. Lectures in German; oral and written reports in German.

Three hours. Through the year. Elective for students who have credit for 2 or 5. Each term may be elected independently. Not offered in 1907–8.

[29, 30, 31. *The German Drama of the Nineteenth Century*]

Kleist, Grillparzer, Hebbel, Hauptmann, and Sudermann. A study of the development of the drama from waning romanticism to realism. With frequent reference to the chief representatives of the modern drama in other countries.

Three hours. Through the year. Elective for students who have credit for 5, 6, or 7. Each term may be elected independently. Not offered in 1907–8.

32. *Lessing and Schiller*

A study of the life and representative works of each author and the problems they present. *Professor* CROWELL.

Three hours. Through the year. Elective for students who have credit for 5 or 7. *Tu., Wed., Sat., at 9.20.*

[10. *Goethe's Faust: Parts* 1 *and* 2]

With some notice of recent dramas of kindred interest. *Professor* CROWELL.

Three hours. Through the year. Elective for students who have credit for 5 or 7. Not offered in 1907–8.

33, 34, 35. *Goethe: A Study of His Life and Works*

Lectures in German; reports on assigned topics; extensive reading. *Professor* VON KLENZE.

Three hours. Through the year. Elective for students who have credit for 7, 10, 12, 14, or 16. *Tu., Th., Sat., at 12.20.*

[12, 13, 14. *Outline History of German Literature*]

Aims to acquaint the student with the most important movements in the evolution of German literary life. Lectures in German; reports on assigned topics; extensive reading. *Professor* VON KLENZE.

Three hours. Through the year. Elective for students who have credit for 7, 10, 12, 14, or 16. Not offered in 1907–8.

[16. *Gothic and Old High German*]

The Gothic language with reading of extracts in Streitberg's *Gotisches Elementarbuch* or Braune's *Gotische Grammatik*. Braune's *Althochdeutsche Grammatik* and *Althochdeutsches Lesebuch.*

Three hours. Through the year. Elective for Graduates. Not offered in 1907–8.

17. *Germanic Mythology*

Primitive Germanic religion, customs, and ideas, in their relations to German literature. Discussions based on E. Mogk's *Germanische Mythologie*. *Professor* CROWELL.

One hour. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu. at 3.20.*

20. *Old Norse*

Holthausen's *Altisländisches Elementarbuch;* Wilken's *Prosaische Edda; Die Lieder der Edda,* edited by Sijmons and Gering. *Professor* CROWELL.

Two hours. Through the year. Elective for Graduates. Students electing Old Norse should also take Germanic Mythology. *Mon., Th., at 4.20.*

[15. *Middle High German*]

The language of the Middle High German period, including an introduction to Germanic philology. Michel's *Mittelhochdeutsches Elementarbuch; Das Nibelungenlied. Professor* VON KLENZE.

Three hours. Through the year. Elective for students who have credit for 7, 10, 12, 14, 16, or 18. Not offered in 1907–8.

36. *Seminary in German Literature*

Aims to give training in modern methods of investigation and criticism. To be carried on in German. Subject for 1907–8: Problems affecting the sources, the evolution, and the technic of the short story of the nineteenth century. *Professor* VON KLENZE.

Three hours. One session weekly. Through the year. Elective for approved students.

50. *The Classical Literature of Germany in English*

A study of Lessing, Schiller, and Goethe, by means of English translations, in the light of the German culture of the eighteenth century, with supplementary lectures on the German drama of the nineteenth century. *Professor* VON KLENZE.

Three hours. Second Term. Elective for Sophomores and Juniors who have taken French 50. *Tu., Wed., Sat., at 9.20.*

XII. GREEK LITERATURE AND HISTORY ‡

JAMES IRVING MANATT, PH.D., LL.D., *Professor of Greek Literature and History*

FRANCIS GREENLEAF ALLINSON, PH.D., *David Benedict Professor of Classical Philology*

LIDA SHAW KING, A.M., *Assistant Professor of Classical Philology*

————————————, *Instructor in Greek*

A, B, C. *Elementary Course*

Designed to cover as much as possible of the entrance requirements in Greek, and thus to enable a student to take 1, 2, and 3 in the following year if he completes by private study before the opening of the first term the entire requirement in the *Anabasis,* and before the opening of the third term the entire requirement in Homer. *Mr.* ——.

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‡ Courses 1, 2, 3 are a prerequisite for the more advanced courses in this department.

Three hours. Through the year. Elective for students who did not present elementary and advanced Greek for admission. *Tu., Th., Sat., at 12.20.*

1. *Plato*

Plato's *Apology* and *Crito,* with select orations of Lysias for sight reading. *Professor* ALLINSON.

Three hours. First Term. Elective for students who presented elementary and advanced Greek for admission, or who have credit for Greek A, B, C and have done the additional work indicated above. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Tu., Th., Sat., at 12.20.*

2. *Homer*

The *Odyssey,* four books; rapid reading of other books; lectures on the life of the Heroic Age as revealed in the poems and illustrated by recent archaeological research. *Professor* MANATT.

Three hours. Second Term. Elective for students who have credit for 1. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Tu., Th., Sat., at 12.20.*

3. *Sophocles and Herodotus*

The *Antigone* of Sophocles; selections for sight reading from Herodotus. *Professor* ALLINSON.

Three hours. Third Term. Elective for students who have credit for 1 and 2. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Tu., Th., Sat., at 12.20.*

5. *Greek Lyric Poets*

The chief remains of Greek lyric poetry from Alkman to Timotheos (not including Pindar). *Professor* MANATT.

Three hours. First Term. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

4. *Lucian*

Selected writings. *Professor* ALLINSON.

Three hours. Second Term. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

6. *Dramatic Poets*

Lectures on the Greek drama. The *Prometheus* of Aeschylus; the *King Oedipus* of Sophocles. *Professor* ALLINSON.

Three hours. Third Term. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

7. *Plato and Aeschylus*

Republic, book x; selections from books i-ix; *Agamemnon. Professor* Allinson.

Three hours. First Term. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

[8. *Homer*]

Advanced course in the *Iliad* or the *Odyssey,* intended to serve as an introduction to prehistoric archaeology and as a preparation for teaching Homer. *Professor* Manatt.

Three hours. First Term. Elective for Juniors and Seniors. Not offered in 1907–8.

12. *Thucydides*

The Sicilian expedition. *Professor* Manatt.

Three hours. Third Term. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

[9. *Theocritus and Herondas*]

Twenty *Idylls* of Theocritus and selected *Mimes* of Herondas. *Professor* Manatt.

Three hours. Third Term. Elective for Juniors and Seniors. Not offered in 1907–8.

[10. *The Drama*]

The *Medea* of Euripides and the *Frogs* of Aristophanes, with rapid reading of the *Seven against Thebes* of Aeschylus for literary criticism. *Professor* Allinson.

Three hours. First Term. Elective for Juniors and Seniors. Not offered in 1907–8.

11. *Herodotus*

History of the Persian wars. *Professor* Manatt

Three hours. Second Term. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

[13. *Lucian*]

Advanced course. *Professor* Allinson.

Three hours. First Term. Elective for Juniors and Seniors. Not offered in 1907–8.

[14. *Aeschines and Demosthenes*]

Speeches on the Crown; study of the Macedonian period and of Athenian political life. *Professor* MANATT.

Three hours. Second Term. Elective for Juniors and Seniors. Not offered in 1907–8.

[16, 17, 18. *Homer*]

The *Odyssey;* portions of the *Iliad* and the *Hymns* in the original; the remainder of the poems in translation. *Professor* MANATT.

Three hours. Through the year. Elective for Juniors and Seniors. Not offered in 1907–8.

19, 20. *Greek Composition*

Professor ALLINSON.

One hour. Second and Third Terms. Elective for Sophomores, Juniors, and Seniors. *Fri. at 2.20.*

21, 22. *Modern Greek*

Introduction to the language; readings from living Greek authors and Greek newspapers. *Professor* MANATT.

One hour. Second and Third Terms. Elective for Sophomores, Juniors, and Seniors.

23, 24, 25. *Greek Seminary*

Subjects for 1907–8: Aristotle's *Politics;* the *Oresteia* of Aeschylus or Greek epigraphy (Roberts and Gardner); Comparative philology, see Indo-European Philology 4. *Professors* MANATT (23), *and* ALLINSON (24, 25).

One two-hour session weekly. Through the year. Elective for Graduates and approved Seniors.

[26. *Attic Orators*]

Isaeus; Greek historical inscriptions. *Professor* MANATT.

Two hours. First Term. Elective for Graduates and approved Seniors. Not offered in 1907–8.

[27, 28. *Homer and Mycenaean Archaeology*]

The Achillean books of the *Iliad* and the Ithacan books of the *Odyssey* studied in the light of recent archaeological discoveries. *Professor* MANATT.

Two hours. First and Second Terms. Elective for Graduates and approved Seniors. Not offered in 1907–8.

[29. *Demosthenes*]

Private speeches, selected to illustrate the workings of Athenian institutions. *Professor* MANATT.

Three hours. First Term. Elective for Graduates. Not offered in 1907–8.

30, 31, 32. *Hellenistic Greek*

Characteristics of Hellenistic Greek (*ἡ κοινή*). The Apologies of Justin Martyr, or selections from the New Testament. This course is the same as course 7, 8, 9, offered by the department of Biblical Literature and History. Second term, *Professor* ALLINSON. First and third terms, *Professor* FOWLER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

[33. *Greek Life*]

The private and public life of the Greeks studied in the light of their literature and monuments. Syllabus, lectures, and prescribed reading, with frequent reports, written tests, and essays. No knowledge of Greek or Latin required. The course is continued in the second and third terms as Latin 28, 29. The three terms together constitute the course in the History of Greek and Roman Life and Institutions, which alternates with Greek 34, Latin 30, and Indo-European Philology 1. *Professor* MANATT.

Three hours. First Term. Elective for Freshmen and Sophomores. Not offered in 1907–8.

34. *Greek Literature*

A brief history of the literature of the Greeks from Homer to Theocritus, with study of the masterpieces in the best English translation. No knowledge of Greek or Latin required. This course is continued in the second and third terms as Latin 30 and Indo-European Philology 1. The three terms together constitute the course in Greek and Roman Literature and the History of Language, which alternates with Greek 33, Latin 28, 29. *Professor* ALLINSON.

Three hours. First Term. Elective for Freshmen and Sophomores. *Mon., Tu., Th., at 11.20.*

36. *Introduction to Greek Archaeology*

Outline of the remains of the earliest Greek civilization; an introductory study of Greek vases, coins, small bronzes, and terra-cotta figurines. Intended to give a general survey of these sources for Greek history and life. Illustrated lectures; collateral reading. *Professor* King.

Three hours. Third Term. Elective for students in the Women's College who have completed one course in Latin or Greek.

XIII. HISTORY ‡

William MacDonald, Ph.D., LL.D., *Professor of History*
Wilfred Harold Munro, A.M., *Professor of European History*

1. *Medieval and Modern History of Europe*

A general survey of the history of western Europe from the time of the barbarian invasions to 1789. A narrative text-book supplemented by lectures, frequent written tests, and written reports and abstracts on assigned reading and topics for special investigation. *Professor* MacDonald.

Three hours. Through the year. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy in either the Sophomore or the Junior year. *Mon., Tu., Th., at 2.20.*

2. *Spanish History*

Development of Spanish institutions, political and social; rise and greatness of Spain as a European power; its colonial system; its position with reference to the Reformation and the subsequent religious wars. *Professor* Munro.

Three hours. First Term. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

3. *Islam and the Crusades*

Social and political conditions in Europe and the East at the beginning of the Crusades; organization and internal condition of Islam; effect of the Crusades on the thought, life, and political development of Europe. *Professor* Munro.

Three hours. Second Term. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

4. *Period of the Renaissance*

Preparation for the Renaissance in the intellectual and social life of Europe; spread of the revival; connection between the Renaissance and the Reformation; artistic and literary aspects of the movement. *Professor* Munro.

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‡ The elective courses in History are regularly open only to those who have credit for 1; but, by special permission of the instructor, elective courses may be taken by Juniors who are at the same time taking 1.

Three hours. First Term. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

5. *Period of the Reformation*

Early movements of dissent from the Roman Church; the Protestant revolt in Germany, Switzerland, France, and England; the political and social aspects of the Reformation; the religious wars; the effect on religious belief and church organization. *Professor* Munro.

Three hours. Second Term. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

6. *The French Revolution*

Rise and progress of the Revolution in France; political and social conditions in Europe 1789–1815; permanent results of the Revolution, particularly its effect on political thought and practice. *Professor* Munro.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

7. *European History since 1815*

Political development of the more important states and their diplomatic relations; the revolutions of 1830 and 1848; the free-trade movement in England; the achievement of Italian unity; the founding of the German Empire; the Franco-Prussian war; the Eastern question, etc. *Professor* Munro.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

8, 9, 10. *English Constitutional and Political History to 1689*

Formation of the English constitution; establishment and growth of the church; relations with Scotland and Ireland; the Reformation; the Puritan Revolution. *Professor* Munro.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Tu., Th., at 2.20.*

[11, 12, 13. *English Constitutional and Political History since 1689*]

Foreign relations; the development of party government and the cabinet system; the social and political changes of the nineteenth century. *Professor* Munro.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. Not offered in 1907-8. To be offered in 1908-9.

14, 15, 16. *Seminary in European History*

Discussion of assigned subjects, reports of reading and investigation, and similar exercises. *Professor* MUNRO.

Three hours. One hour of class-room attendance. Through the year. Elective for Graduates and approved Seniors. Each term may be elected independently.

19,20,21. *Constitutional and Political History of the United States*

An advanced course covering the period from 1783 to the present time. Intended primarily for those who wish to specialize in American history or who expect to study law. *Professor* MACDONALD.

Three hours. Two meetings a week. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., at 12.20.*

22, 23, 24. *Seminary in American History*

Designed to afford training in historical investigation and practice in the use of sources. The subjects vary from year to year, and are drawn from both the colonial and the constitutional periods. For 1907-8 the subjects are: First term, The Second Continental Congress; Second term, The foreign relations of the United States under Washington and Adams; Third term, Topics in the social and economic history of the United States, 1815-45. *Professor* MACDONALD.

Three hours. One hour of attendance. Through the year. Elective for Graduates and approved Seniors. The course presupposes an acquaintance with 27, 28, 29 or 19, 20, 21, but by special permission it may be taken by those who are taking 27, 28, 29 or 19, 20, 21. Each term may, by the consent of the instructor, be elected independently.

27, 28, 29. *American History*

A general course covering the whole period from the beginnings of English colonization to the end of the Civil War. Lectures, supplemented by assigned reading, study of the texts of representative documents, and special reports. Intended as an introduction to the advanced courses in American history, and for those students who wish only a general survey of the subject or who expect to teach history. *Professor* MACDONALD.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

[25.* *Principles of Historical Criticism and Research*]

First term, The general principles of historical criticism and the literature of historical theory; Langlois and Seignobos's *Introduction to the Study of History* is used as a manual. Second and third terms, Historical bibliography, the periods chosen varying from year to year. *Professor* MacDonald.

One hour. Through the year. Elective for Graduates of one year's standing. Required of all candidates for the degree of Doctor of Philosophy in History. Not offered in 1907–8.

XIV. INDO-EUROPEAN PHILOLOGY

Francis Greenleaf Allinson, Ph.D., *David Benedict Professor of Classical Philology*

1. *General Introduction to the Study of Language*

Outline of the history of language; the Indo-European family. Adapted for students of ancient or modern languages. A continuation of Greek 34, Latin 30. The three terms together constitute the course in Greek and Roman Literature and the History of Language.

Three hours. Third Term. Elective for Freshmen and Sophomores. *Mon., Tu., Th., at 11.20.*

4. *Seminary in Comparative Philology*

For advanced students in Greek and Latin.

One two-hour session weekly. Third Term. Elective for Graduates and approved Seniors.

7, 8, 9. *Sanskrit, elementary course*

Whitney's *Grammar;* Lanman's *Reader;* selections from the *Vedic Hymns.*

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

[10, 11, 12. *Sanskrit, advanced course*]

Vedic Hymns, and other selections.

One hour. Through the year. Elective for students who have credit for 7, 8, 9. Not offered in 1907–8.

XV. MATHEMATICS‡

NATHANIEL FRENCH DAVIS,† A.M., LL.D., *Professor of Pure Mathematics*

HENRY PARKER MANNING, PH.D., *Associate Professor of Pure Mathematics*

FREDERICK SLOCUM, PH.D., *Assistant Professor of Astronomy*

ROLAND GEORGE DWIGHT RICHARDSON, PH.D., *Assistant Professor of Pure Mathematics*

CLINTON HARVEY CURRIER, A.M., *Instructor in Mathematics*

——————————, *Instructor in Mathematics*

3. *Algebra*

Professors MANNING, SLOCUM, *and* RICHARDSON, *Messrs.* CURRIER *and* ——.

Four hours. First Term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Tu., Wed., Fri., Sat., at 9.20.*

1. *Geometry, Solid and Spherical*

Professors MANNING, SLOCUM, *and* RICHARDSON, *Messrs.* CURRIER *and* ——.

Four hours. Second Term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Tu., Wed., Fri., Sat., at 9.20.*

2. *Trigonometry*

Professors MANNING, SLOCUM, *and* RICHARDSON, *Messrs.* CURRIER *and* ——.

Four hours. Third Term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Tu., Wed., Fri., Sat., at 9.20.*

4. *Analytic Geometry*

Messrs. CURRIER *and* ——.

Three hours. First and Second Terms. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. Elective for students who have credit for 1, 2, 3. *Mon., Wed., Th., at 10.20.*

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‡ The Undergraduate courses 1-11 should be taken in the order in which they are printed. Courses 12, 13, 14 may be taken at any time after the Freshman year. Courses 17-21 are designed for students who are taking or who intend to take Engineering courses. Courses 22-26 are designed for Graduates: two or three of these courses are offered each year according to the needs of the students. For those who have taken all of them, other courses can usually be arranged.

† On leave of absence during the academic year 1907-8.

5. *Differential Calculus*

Professor RICHARDSON.

Three hours. Third Term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. Elective for students who have credit for 4. *Mon., Wed., Th., at 10.20.*

6. *Integral Calculus*

Professor SLOCUM.

Three hours. First Term. Elective for students who have credit for 5. *Tu., Th., Sat., at 12.20.*

7. *Applications of the Differential Calculus*

Professor SLOCUM.

Three hours. Second Term. Elective for students who have credit for 5 and 6. *Tu., Th., Sat., at 12.20.*

8. *Applications of the Integral Calculus*

Professor SLOCUM.

Three hours. Third Term. Elective for students who have credit for 6. *Tu., Th., Sat., at 12.20.*

9, 10, 11. *Differential Equations*

Professor RICHARDSON.

Three hours. Through the year. Elective for students who have credit for 6 or 21. First term required of candidates for the degree of Bachelor of Science in Electrical Engineering. *Tu., Th., Sat., at 12.20.*

12. *Determinants and Theory of Equations*

Mr. CURRIER.

Three hours. Second Term. Elective for students who have credit for 3 or 16.

[13. *Modern Methods of Analytic Geometry*]

Professor MANNING.

Three hours. Third Term. Elective for students who have credit for 4 or 19. Not offered in 1907–8.

14. *Solid Analytic Geometry*

Professor MANNING.

Three hours. Third Term. Elective for students who have credit for 4 or 19.

15. *Spherical Trigonometry*

Mr. ——.

One hour. First Term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. Elective for students who have credit for 2 and who have not taken Spherical Trigonometry. *Mon., Th., at 9.20.*

16. *Algebra*

Mr. ——.

One hour. First Term. Two hours, Second and Third Terms. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. *Mon., Th., at 9.20.*

17. *Algebra*

Professor RICHARDSON, *Messrs.* CURRIER *and* ——.

Six hours. First Term. Required of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., at 11.20.*

18. *Trigonometry, Plane and Spherical*

Professors SLOCUM *and* RICHARDSON, *Mr.* ——.

Six hours. Second Term. Required of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., at 11.20.*

19. *Analytic Geometry*

Professor SLOCUM, *Messrs.* CURRIER *and* ——.

Six hours. Third Term. Required of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., at 11.20.*

20. *Differential Calculus*

Professors MANNING *and* SLOCUM, *Mr.* CURRIER.

Five hours. First Term. Required of candidates for the degree of Bachelor of Science. *Tu., Wed., Th., Fri., Sat., at 8.*

21. *Integral Calculus*

Professors MANNING, SLOCUM, *and* RICHARDSON, *Mr.* CURRIER.

Three hours. Second and Third Terms. Required of candidates for the degree of Bachelor of Science. *Tu., Wed., Fri., at 8.*

[22. *Theory of Functions*]

Professor MANNING.

Three hours. Through the year. Elective for Graduates and approved Seniors. Not offered in 1907–8.

23. *Differential Equations, advanced course*‡

Professor MANNING.

Three hours. Through the year. Elective for Graduates who have credit for 22.

24. *Advanced Algebra*

Professor MANNING.

Three hours. Through the year. Elective for Graduates and approved Seniors.

25. *General Theory of Curves and Surfaces*‡

Professor MANNING.

Three hours. Through the year. Elective for Graduates and approved Seniors.

26. *Quaternions and allied subjects*‡

Professor MANNING.

Three hours. Through the year. Elective for Graduates and approved Seniors.

XVI. MECHANICAL ENGINEERING§

WILLIAM HERBERT KENERSON, M.E., A.M., *Associate Professor of Mechanical Engineering*

THURSTON MASON PHETTEPLACE, PH.B., M.E., *Assistant Professor of Mechanical Engineering*

GEORGE LAWTON SPENCER, M.E., *Assistant in Mechanical Engineering*

HENRY DEWEES CADY, *Instructor in Shop Practice*

1, 2, 3. *Wood-work*

Exercises in carpentry, wood-turning, and pattern-making. *Mr.* CADY.

Three hours in any term. Seven hours of attendance. Elective for Sophomores, Juniors, and Seniors who have had instruction in drawing. *Tu. 2.20 to 5.20; Fri. 2.20 to 6.20.*

4, 5, 6. *Metal-work*

Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. *Mr.* CADY.

Three hours in any term. Seven hours of attendance. Elective for Sophomores, Juniors, and Seniors who have had instruction in drawing. *Wed. 2.20 to 5.20; Fri. 2.20 to 6.20.*

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‡ One of the three courses 23, 25, 26 will be offered if applied for.

§ All courses in this department are required of candidates for the degree of Bachelor of Science in Mechanical Engineering. Courses 1–6 are all elective for Sophomores, Juniors, and Seniors, but not more than two of them may be counted towards the degree of Bachelor of Arts or Bachelor of Philosophy.

8. *Kinematics*

Velocity ratios, rolling surfaces, cams, and belting. Recitations, drawing, and the solution of problems. *Professor* PHETTEPLACE.

Three hours. Seven hours of attendance. Third Term. Elective for students who have credit for Mechanical Drawing 5. *Tu. 12.20 to 1.20, 2.20 to 5.20; Fri. 2.20 to 5.20.*

9, 10, 11. *Kinematics*

Gearing, linkwork, parallel motions, and gear trains; machine tools; the application of the principles involved. Recitations, drawing, and the solution of problems. *Professor* PHETTEPLACE.

Three hours. Seven hours of attendance. Through the year. Elective for students who have credit for 8 and for Mechanical Drawing 5. *Mon. 2 to 6; Th. 2.20 to 5.20.*

12, 13, 14, 15. *Machine Design*

Applications of the principles of mechanics and the strength of materials to the design of representative types of boilers, engines, and various mechanisms; solution of problems illustrating the method of designing bolts and nuts, keys, journals and bearings, fly-wheels, valve gears, etc. Lectures, calculation, and drawing. *Professor* PHETTEPLACE.

Three hours. Six hours of attendance. First, Second, Third, and Third Terms. Elective for students who have credit for 8, 9, 10, 11 and Mechanics 1. *Mon., Th., 10.20 to 1.20.*

16, 17, 18. *Thermodynamics*

Applications of the principles of gases and vapors to steam, gas, and other heat engines, air-compressors, refrigerating apparatus, etc.; discussion of the energy of fuel and the utilization of such energy for power purposes by means of various media; laws of the relation of variations of pressure, temperature, and volume of such media; design of cylinders to produce a desired amount of power; the principles of the injector and the ejector. *Professor* KENERSON *and Mr.* SPENCER.

Three hours. First, Second, and Third Terms. Elective for students who have credit for Mathematics 5, 6, 7 or 20, 21. First and second terms, *Wed., Fri., Sat., 12.20.* Third term, *Mon., Wed., Th., 9.20.*

19, 20, 21. *Engineering Practice*

Applications of the principles of thermodynamics and mechanics to the production, transmission, utilization, and measurement of power; valves and valve gears, and valve setting; indicator practice and tests of various forms of steam engines, gas engines, etc.; standardization of auxiliary apparatus used in making the various tests; boiler testing; flue gas and fuel analysis, etc. Lectures, recitations, and laboratory work. *Professor* KENERSON *and Mr.* SPENCER.

Three hours. First, Second, and Third Terms. Elective for students who have taken or are taking 16, 17, 18. First and second terms, *Tu., Wed., Sat., at 9.20; Tu. 2.20 to 4.20.* Third term, *Mon., Th., at 8; Tu. 2.20 to 4.20.*

22. *Materials of Engineering*

Study of the sources, manufacture, and properties of the important materials used in engineering; laboratory tests to determine the behavior of materials when subjected to tensile, compressive, and torsional stresses; mixing and testing of cements and mortars; preparation and examination of sections for the microscopical study of the structure of metals and alloys. Lectures, recitations, and laboratory work. *Professor* KENERSON *and Mr.* SPENCER.

Three hours. First and Second Terms. Elective for students who have taken or are taking Mechanics 3. *Wed., Fri., at 10.20. 1st div. Mon. 2.20 to 4.20; 2d div. Tu. 2.20 to 4.20; 3d div. Th. 2.20 to 4.20; 4th div. Mon. 9.20 to 11.20.*

23. *Power Plant Engineering*

Discussion of the relation and coördination of the various parts of the complete power plant; management, and methods of determining efficiency; selection of the best equipment from manufacturers' catalogues and actual inspection. Lectures, recitations, tests, and tours of inspection. *Professors* KENERSON *and* PHETTEPLACE.

Three hours. First Term. Elective for students who have credit for 19, 20, 21. *Wed., Fri., 2.20 to 5.20.*

24. *Advanced Laboratory Course*

Investigation of special problems in hydraulic and steam engineering. Determination of experimental constants for the Venturi meter, flow of water over weirs and through pipes, flow of air, steam, etc. Particular emphasis laid on preparation and form of reports. *Professor* KENERSON.

Three hours. Second Term. *Wed., Fri., 2 to 5.*

25. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Mechanical Engineering. The thesis must embody either a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XVII. MECHANICS AND MECHANICAL DRAWING

Otis Everett Randall, Ph.D., *Professor of Mechanics and Mechanical Drawing*

Ansel Brooks, Ph.B., M.E., *Assistant Professor of Mechanics and Mechanical Drawing*

William Arthur Kennedy, Ph.B., Sc.B., *Instructor in Mechanical Drawing*

MECHANICS

1. *Mechanics of Solids*

Statics, including resolution and composition of forces, determination of center of gravity, and problems relative to rigid bodies and flexible cords; dynamics, including rectilinear and curvilinear motion, virtual velocity, moment of inertia, work, energy and power, and friction; strength of materials, including tension, compression, shearing, torsion, flexure, and arches; methods of graphical solution of problems. *Professors* Randall *and* Brooks.

Three hours. Through the year. Elective for students who have credit for Mathematics 4 and 5, and who have taken or are taking Mathematics 6. First and second terms required of all candidates for the degree of Bachelor of Science. *Mon., Tu., Th., at 11.20.*

3. *Strength of Materials*

Tension, compression, shearing, torsion, flexure, arches, and graphical solution of problems. *Professors* Randall *and* Brooks.

Six hours. Third Term. Required of all candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., at 11.20.*

2. *Mechanics of Fluids*

Hydrostatics; nature and use of instruments; flow through orifices, over weirs, through tubes, through pipes, in conduits, flow of rivers, water supply and water power, dynamic pressure of water, water wheels, turbines, pumps and pumping. *Professor* Randall.

Three hours. First and Second Terms. Required of all candidates for the degree of Bachelor of Science. Elective for students who have credit for 3. *Wed., Fri., Sat., at 11.20.*

4. *Advanced Mechanics*

Higher theoretical and practical problems. *Professor* RANDALL.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 3.

MECHANICAL DRAWING

1. *Elementary Mechanical Drawing, and Descriptive Geometry*

Nature, care, and use of drafting instruments; plane problem construction; theory of orthographic projection; discussion, proof, and graphic solution of problems in descriptive geometry relating to the point, line, and plane, to line and surface generation and classification, to surface tangency, and to intersections and developments; application of the principles of descriptive geometry in isometric drawing, in shades and shadows and perspective, in machine drawing, and in practical engineering problems. *Professors* RANDALL *and* BROOKS, *Mr.* KENNEDY.

Four hours. Through the year. First term, one hour of recitation and six hours of drawing. Second and third terms, three hours of recitation and three hours of drawing. Required in the Freshman year of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., at 9.20 and 10.20.*

2. *Elementary Mechanical Drawing*

Nature, care, and use of drafting instruments; plane problem construction; theory of orthographic and isometric projection. *Professor* RANDALL *and Mr.* KENNEDY.

Three hours. Six hours of drawing. First Term. Elective for Freshmen who are candidates for the degree of Bachelor of Philosophy, and for all Sophomores, Juniors, and Seniors. *Mon., Wed., Th., at 10.20.*

3. *Descriptive Geometry*

Discussion, proof, and graphic solution of problems in descriptive geometry. *Professor* RANDALL *and Mr.* KENNEDY.

Three hours. Two hours of recitation and two hours of drawing. Second and Third Terms. Elective for Freshmen who are candidates for the degree of Bachelor of Philosophy, and for Sophomores, Juniors, and Seniors who have credit for 2. *Mon., Wed., Th., at 10.20.*

4, 5. *Machine Drawing*

Study and representation of machine parts; the principles of elementary machine design; sketches, detail and assembly drawings of machines; practice in reading drawings. *Professor* BROOKS *and Mr.* KENNEDY.

Three hours. One hour of recitation and eight hours of drawing. First and Second Terms. Required of candidates for the degree of Bachelor of Science in Mechanical Engineering and Electrical Engineering. Elective for students who have credit for 3. *Tu. at 12.20; Mon., Th., 2.20 to 5.20.*

6. *Elements of Machine Design*

Professor BROOKS.

Three hours. One hour of recitation and five hours of drawing. Third Term. Elective for students who have credit for 5.

7. *Shades and Shadows and Perspective; Architectural Drawing*

Problems relating to the shade and shadow and perspective of elementary magnitudes; the principles of architectural design and composition; working drawings and ordinary office practice. *Professor* RANDALL.

Three hours. Six hours of drawing. Through the year. Elective for students who have credit for 1 or 3. Given at the University during the first term, and at the Rhode Island School of Design during the second and third terms.

8. *Mechanical Drawing, practical*

For students desiring to continue their course in drawing without taking the theoretical work of descriptive geometry. Intersections and developments; third quadrant projection; sketching and dimensioning; conventional methods of representing machine parts; detailing and assembling; exercises in reading drawings; architectural drawing, including the drawing of plans and elevations, and the details of building construction. *Professor* BROOKS.

Three hours. Six hours of drawing. Second and Third Terms. Elective for students who have credit for 2. *Mon., Wed., Th., at 10.20.*

XVIII. PHILOSOPHY

WILLIAM HERBERT PERRY FAUNCE, A.M., D.D., LL.D., *Professor of Moral and Intellectual Philosophy*

EDMUND BURKE DELABARRE, PH.D., *Professor of Psychology*

WALTER GOODNOW EVERETT, PH.D., *Professor of Philosophy and Natural Theology*

WALTER BALLOU JACOBS, A.M., *Professor of the Theory and Practice of Education*

ALEXANDER MEIKLEJOHN, PH.D., *Professor of Logic and Metaphysics*

1. *Logic*

Aims, methods, and limitations of human thinking; a preparation for work in the sciences and in philosophy. First term, general introduction and formal logic. Second term, principles and methods of the natural sciences. Third term, relations of science to philosophy; philosophical interpretation and criticism of the results of science. *Professor* MEIKLEJOHN.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon., Th., Fri., at 9.20.*

2. *Psychology, introductory course*

The main facts and laws of mental life, with particular attention to their arrangement in a scientific system, and to their philosophical bearing. The course furnishes a knowledge of mental law important for practical life, and serves also as a transition from the special sciences to philosophy. *Professor* DELABARRE.

Three hours. Through the year. Elective for Juniors. *Wed., Fri., Sat., at 11.20.*

3. *Psychology, advanced course*

A seminary for the discussion of important and interesting questions in psychology, especially the problems of mental composition, of the relation of mind and body, and of hypnotism and psychical research. *Professor* DELABARRE.

Three hours. Through the year. Elective for Seniors and Graduates.

4. *Experimental Psychology, introductory laboratory course*

Description of the main lines and results of experimental research; demonstrations by the instructor or the class; training in the use of apparatus and in careful scientific observation and measurement. *Professor* DELABARRE.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have taken or are taking 2. Although essentially a year course, it may, by special arrangement with the instructor, be taken for a shorter period.

5. *Experimental Psychology, advanced laboratory course*

The problems investigated vary and the course may therefore be taken two or more years in succession. The aim is to make original contributions to scientific knowledge in psychology and to publish the results. *Professor* DELABARRE.

One to six hours. Two to twelve hours of attendance. Through the year. Elective for students who have credit for 4. May be taken for more than six hours by Graduates.

6, 7, 8. *History of Philosophy*

The successive philosophical systems in their dialectical development and mutual relations; treatment not merely analytic and historical, but synthetic and constructive as well. First term, Greek philosophy. Second term, medieval and early modern philosophy. Third term, recent and contemporary philosophy. *Professor* EVERETT.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

9, 10. *Theoretical Ethics*

Intended to aid in mastering the fundamental problems of life and character. First term, a discussion of the nature and relations of ethics and an outline of the history of the chief ethical systems. Second term, a critical study of the fundamental concepts of ethics with the aim of constructing a tenable theory of conduct. *Professor* EVERETT.

Three hours. First and Second Terms. Elective for Juniors, Seniors, and Graduates. *Tu., Wed., Sat., at 9.20.*

11. *Practical Ethics*

The application of ethical theory to the life of the individual, the family, and the state. Discussion of current problems, personal, industrial, and social, from the ethical standpoint. *President* FAUNCE.

Three hours. Third Term. Elective for Juniors and Seniors. *Tu., Wed., Sat., at 9.20.*

12. *Philosophy of Religion*

An investigation of the ultimate problems of religious belief. *Professor* EVERETT.

Three hours. Third Term. Elective for Seniors and Graduates who have credit for one course in Philosophy. *Tu., Wed., Sat., at 9.20.*

13, 14, 15. *Philosophical Seminary*

Lectures, written reports, and discussions on the more difficult problems of philosophy. Subject for 1907–8: The philosophical systems of Schopenhauer and Hartmann. *Professor* EVERETT.

Three hours. Through the year. Elective for Graduates.

[16. *Kantian and Post-Kantian Philosophy*]

Kant's *Critique of Pure Reason* studied as the source of German rationalism. *Professor* MEIKLEJOHN.

Three hours. Through the year. Elective for Seniors who have credit for 6, 7, 8, and for Graduates. Not offered in 1907–8.

17. *Advanced Logic*

A seminary for the discussion of the more fundamental problems of logical theory. Reading, written reports, and discussions. *Professor* MEIKLEJOHN.

Three hours. Through the year. Elective for Seniors who have credit for 6, 7, 8, and for Graduates.

EDUCATION‡

Professor JACOBS

1. *History of Education*

Education among the early culture peoples as forming and perpetuating their civilization; the development of education in Greece and Rome as parallel to the development of thought and learning; early Christian education; the renaissance and humanism; the rise of realism in thought and education. The history of education considered from the point of view of the history of civilization.

Three hours. First Term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

‡ Courses 1, 2, and 3 treat education in its relation to the individual and to the social and political whole; interest in them is therefore not limited to those who intend to teach. At the same time they form an introduction to the more advanced courses in Education. Those who intend to teach are advised to elect these courses during the Junior year.

Courses 1–6 cover the usual requirements for certificates of the First Grade except where practice teaching or experience is demanded. In Rhode Island a certificate is required of all teachers in schools supported in whole or in part by public money. Certificates of the First Grade are granted without examination to those who have completed courses 1–6 and hold a college degree. Due credit is also given for separate courses.

2. *Critical Study of Modern Education*

The beginnings of modern education; the naturalistic movement—Rousseau; the psychological movement—Pestalozzi, Froebel, Herbart; the scientific movement—Spencer; recent sociological tendencies; current experiments; problems which an adequate theory of education must solve.

Three hours. Second Term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

3. *Fundamental Principles of Education*

The meaning and aim of education; the function of education as a social institution; the sequence and coördination of studies; the principles of instruction; apperception; the steps in method; the use of the type in instruction; the training of the will; the principles of moral education.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

4. *Psychology of Education*

Theory and process of mental development, with special emphasis upon the period of adolescence; psychology of method, and of the various studies and disciplines; ways in which student and teacher may utilize a knowledge of the more fundamental activities of the mind.

Three hours. First Term. Elective for Seniors and Graduates who have credit for 1, 2, or 3, or who are taking 1. *Mon., Tu., Th., at 11.20.*

5. *Hygiene of Education*

A study of bodily growth and development; special emphasis upon the period of adolescence; play and fatigue; physical culture and athletics; arrested growth; the conditions and surroundings which favor or retard normal development; the hygiene of mind; school hygiene.

Three hours. Second Term. Elective for Seniors and Graduates who have credit for 1, 2, or 3, or who are taking *2. Mon., Tu., Th., at 11.20.*

6. *Practical Introduction to Teaching*

The method of the recitation; management and discipline of classes; observation of good teaching; practical applications of method.

Three hours. Third Term. Elective for Seniors and Graduates who have taken or are taking other courses in Education. *Mon., Tu., Th., at 11.20.*

7, 8, 9. *Methods in Secondary School Studies and the Organization, Equipment, and Management of Secondary Schools*‡
Importance and meaning of secondary school studies; their organization into a curriculum; method as applied to each subject; the resources at the command of the teacher. The following studies receive special attention: First term, Latin and Modern Languages; Second term, History and English; Third term, Science and Mathematics.

Three hours. Through the year. Two hours of class-room attendance. Required of student-teachers. Elective for Graduates and experienced teachers. *Wed. 3.20 to 5.20.* Each term may be elected independently.

10, 11, 12. *Problems in Practical Teaching; Secondary Schools*‡
Practice teaching in the Providence High Schools under experienced teachers. Observation, reports, and conferences. Designed for those who wish to become instructors in colleges, teachers or principals in secondary schools, or superintendents of schools.

Three hours. Through the year. Elective for approved Graduates who have credit for elementary courses in Education and who are taking 7, 8, 9 and 16, 17, 18. *Fri. at 3.20*, and at other hours to be arranged.

13, 14, 15. *Problems in Practical Teaching; Grammar Grades*‡
Practice teaching in the Providence Grammar Schools under experienced teachers. Observation, reports, and conferences. Designed especially for those who wish to become grade teachers, principals of grammar schools, or superintendents of schools, but also for those who wish to teach in secondary schools. The following studies receive special attention: First term, Arithmetic; Second term, Language; Third term, History and Geography.

Three hours. Through the year. Elective for approved Graduates who have credit for elementary courses in Education and who are taking 16, 17, 18. Elective also by special permission for a limited number of Seniors. *Mon. at 3.20*, and at other hours to be arranged.

16, 17, 18. *Seminary in Education*‡
Reviews and discussions of recent publications; reports on special studies undertaken by members. The subjects vary from year to year. For 1907–8 they are: First term, Recent educational theory. Second term, the educational system of France. Third term, History of higher education in America.

‡ In connection with this course, and for an explanation of the work of student-teachers, see the Catalogue, under Arrangements with the School Committee of the City of Providence.

Three hours. Two hours of class-room attendance. Required of student-teachers. Elective for Graduates and experienced teachers. *Sat. 10.20 to 12.20.* Each term may be elected independently.

XIX. PHYSICS

CARL BARUS, PH.D., *Hazard Professor of Physics*
ALBERT DEFOREST PALMER, JR., PH.D., *Associate Professor of Physics*
ARTHUR EUGENE WATSON, PH.D., *Assistant Professor of Physics*
ROBERT FRANKLIN FIELD, A.B., *Assistant in Physics*

1, 2, 3. *Elementary Physics*‡

First term, kinematics and dynamics. Second term, molecular physics. Third term, electricity. Lectures, illustrated by experiments and the lantern; weekly written exercises corrected in detail by the instructors. Designed for those who have had little previous training in physics. *Professor* BARUS.

Three hours. Through the year. Elective for Undergraduates who have credit for Mathematics 1, 2, 3. *Mon., Wed., Th., at 10.20.*

4, 5, 6. *Elementary Physics, continued*‡

First term, optics. Second term, acoustics; polarization of light. Third term, heat. Methods as in 1, 2, 3. *Professor* BARUS.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1, 2, 3. *Tu., Fri., Sat., at 10.20.*

7. *Physical Measurements*

Elementary theory and practice of physical manipulation. Reports of experiments and solution of problems. *Professor* PALMER *and Mr.* FIELD.

Three hours. Six hours in the laboratory. Through the year. Elective for students who have credit for 1, 2, 3 or 4, 5, 6. *Mon. at 12.20.*

8, 9, 10. *Mathematical Treatment of Dynamical Problems*§

Lectures. First term, discussion of the general principles of dynamics and the development of the general equations of motion. Second and third terms, application of these principles to special problems in thermodynamics and hydrodynamics. *Professor* PALMER.

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‡ Graduates attending courses 1, 2, 3, 4, 5, 6 are held responsible for all the demonstrations, or for the full equivalent of either Watson's or Daniel's *Principles of General Physics.*

§ Of the two courses 8, 9, 10 and 11, 12, 13, only one will be offered in any given year. In determining which shall be offered, the preference of applicants will be considered.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 7 and Mathematics 9.

11, 12, 13. *Mathematical Theory of Electricity and Magnetism*‡

Lectures. Includes a discussion of the more important problems of electrical science. *Professor* PALMER.

Three hours. Through the year. Elective for Graduates and Seniors who have credit for 7 and Mathematics 9.

14, 15, 16. *Advanced Laboratory Course*

Special problems and reference to original sources for methods of solution. *Professors* BARUS, PALMER, *and* WATSON.

Three or six hours. Six or twelve hours of attendance. Through the year. Elective for students who have credit for 7.

17, 18, 19. *Applied Harmonic Analysis*§

Importance of Fourier's method shown by examples drawn from the analytical theory of heat, from elastics, alternating electricity, and elsewhere; treatment by the aid of spherical harmonics, Bessel functions, and Lamé functions. *Professor* BARUS.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 1, 2, 3 and Mathematics 7, 9.

20, 21, 22. *Physics, advanced course*§

Lectures on dynamics, potential, elastics, hydrostatics, hydrodynamics, viscosity, capillarity, electrostatics, magnetism, electro-magnetism, thermo-electrics, induction, Fresnel's optics, the electromagnetic theory of light, thermal analytics, and thermodynamics. Completed in two years. *Professor* BARUS.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for Mathematics 5, 6, 7.

23. *Precision Measurements in Photometry, Electricity, Magnetism, and Electro-Chemistry*

Professor PALMER.

Three hours. Six hours in the laboratory. Through the year. Elective for students who have credit for 7 and Mathematics 6.

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‡ Of the two courses 8, 9, 10 and 11, 12, 13, only one will be offered in any given year. In determining which shall be offered, the preference of applicants will be considered.

§ Of the two courses 17, 18, 19 and 20, 21, 22, only one will be offered in any given year. In determining which shall be offered, the preference of applicants will be considered.

ELECTRICAL ENGINEERING‡

Professor Watson

1, 2, 3. *General Course*

First term, definite instruction in methods of generating and utilizing electric currents. Second term, technical study of theory and working of direct current dynamo-electric machinery. Third term, practical methods of operating and testing various sizes and types of standard dynamos and accessory apparatus; lectures on alternating current machinery.

Three hours. Through the year. Elective for students who have taken or are taking Physics 3 and 7 and Mathematics 5 or 20. First term, *Mon., Th., Fri., at 9.20.* Second and third terms, *Mon., Th., at 9.20.*

4, 5, 6. *Alternating Currents*

Mathematical and graphical treatment.

Three hours. Two hours of recitation and two hours of laboratory work. Through the year. Elective for students who have credit for 3 and who have taken or are taking Mathematics 9. *Mon., Th., Fri., at 11.20.*

7, 8, 9. *Industrial Electricity*

First term, telephone and telegraph engineering. Second term, history of electrical engineering. Third term, design and calculation of direct current machinery, including actual drawing of electrical machinery in connection with Mechanical Engineering 11.

Three hours. Through the year. Not elective. To be taken with 1, 2, 3. First term, *Tu., Wed., Sat., at 9.20.* Second and third terms, *Tu., Fri., Sat., at 9.20.*

10, 11, 12. *Special Topics in Electrical Engineering*

First term, electric railway engineering. Second term, design and calculation of alternating current machinery; central station design and equipment; systems of distribution.

Three hours. First and Second Terms. Elective for students who have credit for 1, 2, 3. First term, *Mon., Th., Fri., at 10.20.* Second term, *Tu., Sat., at 10.20* in addition.

13. *Specific Electrical Engineering Problems*

Reading and discussion. Seminary method.

Three hours. Third Term. Not elective. *Mon., Th., Fri., at 10.20.*

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‡ All the courses in this department are required of candidates for the degree of Bachelor of Science in Electrical Engineering. Courses 1, 2, 3, are required of candidates for the

14. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Electrical Engineering. The thesis must embody either a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XX. ROMAN LITERATURE AND HISTORY

Albert Granger Harkness, A.M., *Professor of Roman Literature and History*

John Francis Greene, A.M., *Assistant Professor of Roman Literature and History*

Lida Shaw King, A.M., *Assistant Professor of Classical Philology*

1. *Livy*

Designed to enable the student to acquire facility in reading Latin, and to instruct him in the use of the Latin texts as a means of gaining a knowledge of Roman history; grammatical study and literary criticism also receive attention. *Professors* Harkness *and* Greene.

Three hours. First Term. Elective for students who presented elementary and advanced Latin for admission. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Sat., at 12.20.*

2. *Cicero's Letters*

Aims and methods as in 1. *Professors* Harkness *and* Greene.

Three hours. Second Term. Elective for students who presented elementary and advanced Latin for admission. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Sat., at 12.20.*

3. *Tacitus's Germania and Agricola.*

Aims and methods as in 1. *Professors* Harkness *and* Greene.

Three hours. Third Term. Elective for students who presented elementary and advanced Latin for admission. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Sat., at 12.20.*

4. *Horace's Odes and Epodes*

Critical study of the poems, supplemented by rapid reading with a view to comprehending the spirit of the author; the literary side of

degree of Bachelor of Science in Mechanical Engineering. Courses 1 and 2 are required of candidates for the degree of Bachelor of Science in Civil Engineering.

the study is made prominent. Lectures; literary topics assigned to the class for special study. *Professor* HARKNESS.

Three hours. First Term. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

5. *Catullus, Tibullus, and Propertius*

Aims and methods as in 4. *Professor* GREENE.

Three hours. Second Term. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

6. *Satires of Horace*

Aims and methods as in 4. *Professor* GREENE.

Three hours. Third Term. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

7, 8, 9. *Latin Poetry*

Aims to give a connected and comprehensive view of the history and development of Latin poetry. Forms with 10, 11, 12 a two-year consecutive course affording a general survey of Roman literature. Lectures on the lives and writings of the authors; reading of characteristic selections; special study by members of the class of assigned topics in literary history and criticism. First term, Plautus. Second term, Lucretius. Third term, Juvenal and Martial. *Professors* HARKNESS *and* GREENE.

Three hours. Through the year. Elective for Juniors and Seniors. Each term may be elected independently. *Tu., Fri., Sat., at 10.20.*

[10, 11, 12. *Latin Prose*]

Aims to give a connected and comprehensive view of the history and development of Latin prose. Forms with 7, 8, 9 a two-year consecutive course affording a general survey of Roman literature. Lectures on the lives and writings of the authors, on the development of oratory, etc.; reading of characteristic selections; special study by members of the class of assigned topics in literary history and criticism. First term, specimens of early Latin, Cicero's *Brutus,* and Quintilian. Second term, Cicero. Third term, the *Annals* of Tacitus. *Professors* HARKNESS *and* GREENE.

Three hours. Through the year. Elective for Juniors and Seniors. Each term may be elected independently. Not offered in 1907–8.

13, 14, 15. *Petronius, Pliny the Younger, Martial*

Professor HARKNESS.

One hour. Through the year. Elective for Juniors, Seniors, and Graduates. *Fri. at 2.20.*

[16, 17, 18. *Epigraphy*]

Professor HARKNESS.

Two hours. Through the year. Elective for Graduates and approved Undergraduates. Not offered in 1907–8.

22, 23, 24. *Latin Composition*

Professor GREENE.

One hour. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon. at 3.20.*

25, 26, 27. *Seminary in Latin*

Subject for 1907–8: Palaeography and textual criticism. Reading from the prose of the Empire. Gudeman's *Latin Literature of the Empire,* vol. I. *Professors* HARKNESS *and* GREENE.

Two hours. Through the year. Elective for Graduates.

[28, 29. *Roman Life*]

The private and public life of the Romans. Intended to give a comprehensive view of the civilization of Rome. Study based on the monuments and literature. Lectures, supplemented by reading and reports. No knowledge of Latin required. A continuation of Greek 33, the three terms together constituting the course called the History of Greek and Roman Life and Institutions. *Professor* GREENE.

Three hours. Second and Third Terms. Elective for Freshmen and Sophomores. Not offered in 1907–8.

30. *Roman Literature*

A brief history of Roman literature. Some of the most important and characteristic works studied in English translations. No knowledge of Latin required. Follows Greek 34 and is continued in the third term by Indo-European Philology 1. *Professor* HARKNESS.

Three hours. Second Term. Elective for Freshmen and Sophomores. *Mon., Tu., Th., at 11.20.*

31, 32, 33. *History of the Roman Empire*

First term, the Early Empire. Second term, the Age of the Antonines. Third term, the Age of Constantine. *Professor* GREENE.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Each term may be elected independently. *Tu., Wed., Sat., at 9.20.*

34. *Vergil*

Bucolics, with special reference to literary sources and influence; *Georgics* and *Aeneid,* with special reference to the history of the times. *Professor* King.

Three hours. First Term. Elective for Sophomores in the Women's College.

XXI. ROMANCE LANGUAGES AND LITERATURES

Courtney Langdon, A.B., *Professor of the Romance Languages and Literatures*

Albert Bushnell Johnson, A.M., *Associate Professor of the Romance Languages*

Albert Swift Morse, A.M., *Assistant Professor of the Romance Languages*

Charles Herman Hunkins, A.B., *Instructor in French*

1. *Elementary Course*

Grammar, composition, dictation; translation of selections from modern authors into idiomatic English. The equivalent of the French required for admission. *Professor* Morse *and Mr.* Hunkins.

Three hours. Through the year. Required of all students who did not present French for admission. *1st div. Tu., Th., Fri., at 8; 2d div. Tu., Wed., Sat., at 9.20; 3d div. Mon., Tu., Th., at 2.20.*

2, 3, 4. *Intermediate Course*

First term, review of grammar and sight translation of easy modern authors. Second term, translation of modern authors with composition exercises based upon the text. Third term, selections from classical and modern authors. A general introduction to the study of French literature. *Professors* Johnson *and* Morse, *Mr.* Hunkins.

Three hours. Through the year. Required of all students who presented elementary French for admission. Elective for students who have credit for 1. *1st, 3d, and 5th div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Fri., at 8; 4th div. Tu., Th., Fri., at 3.20.*

5, 6, 7. *French Language and Literature*

An introduction to classical and modern French literature; includes some study of the language. *Mr.* Hunkins.

Three hours. Through the year. Elective for students who presented advanced French for admission. *Mon., Tu., Th., at 11.20.*

8, 9, 10. *French Literature, exclusive of the Drama, from 1800 to 1850*

Chateaubriand, Hugo, Lamartine, De Musset, De Vigny, Balzac, George Sand, and Gautier; abstracts (in French) of works read outside the class; sight reading a prominent feature. *Professor* JOHNSON.

Three hours. Through the year. Elective for students who have credit for 2, 3, 4, or 5, 6, 7. *Mon., Tu., Th., at 11.20.*

[11, 12, 13. *French Literature, exclusive of the Drama, since 1850*]

Flaubert, the Goncourts, Daudet, Zola, Taine, Loti, and others; abstracts (in French) of works read outside the class; sight reading a prominent feature. *Professor* JOHNSON.

Three hours. Through the year. Elective for students who have credit for 2, 3, 4, or 5, 6, 7. Not offered in 1907–8.

14. *Composition*

Practice in writing French. Most appropriately taken in connection with 5, 6, 7; 8, 9, 10, or 11, 12, 13. *Professor* JOHNSON.

One hour. Through the year. Elective for students who have taken 2, 3, 4, or are taking 5, 6, 7. *Fri. at 2.20.*

[17, 18, 19. *Old French*]

The elements of Romance philology and an introduction to the literature of the Middle Ages in France. *Professor* MORSE.

Three hours. Through the year. Elective for approved Seniors and Graduates. Not offered in 1907–8.

20, 21, 22. *French Literature, exclusive of the Drama, from 1600 to 1800*

Pascal, Madame de La Fayette, La Fontaine, Boileau, Bossuet, Madame de Sévigné, Saint-Simon, Le Sage, Voltaire, Rousseau. *Professor* JOHNSON.

Three hours. Through the year. Elective for students who have credit for 10 or 13. *Mon., Wed., Th., at 10.20.*

23, 24, 25. *The French Drama*

A two-year course covering the history of the French drama. The classical school from Corneille to Beaumarchais, and the romantic and realistic schools from Hugo to Rostand will be taken up in alternate years. *Professor* LANGDON.

Three hours. Through the year. Elective for students who have credit for 7, 10, or 13. *Tu., Fri., Sat., at 10.20.*

50. *Molière in English*

A study of Molière's plays, by means of English translations, in the light of the French civilization of the seventeenth century. *Professor* LANGDON.

Three hours. First Term. Elective for Sophomores and Juniors who also elect German 50 and English 50. *Tu., Wed., Sat., at 9.20.*

26, 27, 28. *Modern Italian*

Grammar, composition, conversation, and rapid translation of modern authors. *Professor* MORSE.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern foreign language. *Tu., Fri., Sat., at 10.20.*

29, 30, 31. *Italian Literature from 1321 to 1800*

Selections from Petrarch, Sacchetti, Tasso, Macchiavelli, and Goldoni, with a brief survey of the life and history of the times. *Professor* MORSE.

Three hours. Through the year. Elective for students who have credit for 26, 27, 28. *Mon., Tu., Th., at 11.20.*

[32, 33, 34. *Dante*]

The *Divina Commedia* read in the original. *Professor* LANGDON.

Three hours. Through the year. Elective for students who have credit for 26, 27, 28. Not offered in 1907–8.

35, 36, 37. *Dante in English*

A study of the whole of the *Divina Commedia* in English, in the light of modern thought and in connection with other great world-poems. An introduction to a study of comparative literature by means of the best available translations. *Professor* LANGDON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

38, 39, 40. *Modern Spanish*

Grammar, conversation, composition, writing from dictation, and rapid reading. *Professor* JOHNSON.

Three hours. Through the year. Elective for Juniors, and for Sophomores not electing more than one other modern foreign language. *Tu., Fri., Sat., at 10.20.*

41, 42, 43. *Spanish Literature*

A study of selected works of classical and modern authors. *Professor* LANGDON.

Three hours. Through the year. Elective for students who have credit for 38, 39, 40. *Mon., Wed., Th., at 10.20.*

XXII. SOCIAL AND POLITICAL SCIENCE ‡

GEORGE GRAFTON WILSON, PH.D., *Professor of Social and Political Science*

JAMES QUAYLE DEALEY, PH.D., *Professor of Social and Political Science*

LESTER FRANK WARD, A.M., LL.D., *Professor of Sociology*

POLITICAL SCIENCE

1. *Political Science, elementary*

Affords a general outline of the subject, and serves as an introduction to the more extended and special courses which follow. *Professor* WILSON.

Three hours. First Term. Sophomore, Junior, or Senior year. Required of candidates for the degree of Bachelor of Arts; elective for others. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Mon., Wed., Fri., at 12.20.*

2. *International Relations*

International law, diplomacy, and world-politics. *Professor* WILSON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

3, 4. *American Government* §

First term, constitution, organization, powers, and methods of the national system of government. Second term, organization and functions of the states and cities of the United States. Followed by 5 in the third term. *Professor* DEALEY.

Three hours. First and Second Terms. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

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‡ The courses in this department other than 1 are open only to those students who have credit for Political Science 1, Economics 1, and Social Science 1, which together constitute an introduction to the advanced work of the departments of Social and Political Science and Economics.

§ Courses 3, 4, and 5 form a single course continuous through the year.

5. *Comparative Study of Constitutions*‡

The constitutions of Germany, France, Great Britain, and Switzerland especially considered. *Professor* Dealey.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

8. *Constitutional Law*§

The principles and development of constitutional law, with special reference to the Constitution of the United States. *Professor* Dealey.

Three hours. First Term. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

6. *Roman Law*§

The influence of Roman law on ancient and modern political institutions. *Professor* Wilson.

Three hours. Second Term. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

7. *Jurisprudence*§

The fundamental principles of law and legal relations. *Professor* Wilson.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

9. *The Latin-American Republics*‖

The government and social conditions of the Latin-American Republics. *Professor* Dealey.

Three hours. One term. Offered if applied for by Graduates.

10. *Political Parties*‖

The development of political parties in the United States and Europe. *Professor* Wilson.

Three hours. One term. Offered if applied for by Graduates.

11. *Administration*‖

The principles and the chief national systems of administration. *Professor* Wilson.

Three hours. One term. Offered if applied for by Graduates.

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‡ Courses 3, 4, and 5 form a single course continuous through the year.

§ Courses 6, 7, and 8 form a single course continuous through the year.

‖ Courses 9–15 are primarily for Graduates, and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

12. *Administration* (*continued*)‡

Local and colonial administration. *Professor* Wilson.

Three hours. One term. Offered if applied for by Graduates.

13. *The State*‡

The origin, forms, development, functions, and institutions of the state. *Professor* Dealey.

Three hours. One term. Offered if applied for by Graduates.

14. *Development of Political Theory*‡

The growth of important political ideas traced from Plato to the present time, with emphasis on the evolution of democracy. *Professor* Dealey.

Three hours. One term. Offered if applied for by Graduates.

15. *Current Political Theory and Practice*‡

A seminary course. Intended to train students in methods of estimating the value and significance of recent publications on political topics, and the changes consequent upon current political development. *Professors* Wilson *and* Dealey.

One hour. Through the year. Elective for Graduates.

20, 21, 22. *Investigation of Special Topics*

Intended to train the student in methods of gathering, handling, and presenting data in the study of social and political problems. In connection with this course, work may be taken in comparative legislation under the direction of the Legislative Reference Bureau of the State Library. Laboratory methods. *Professors* Wilson *and* Dealey, *Dr.* Kirk.

Three hours. Six hours of attendance. Through the year. Elective for Graduates and for approved Juniors and Seniors.

SOCIAL SCIENCE

1. *Social Science, elementary*

Affords a general outline of the subject, and serves as an introduction to the more extended and special courses which follow. *Professor* Dealey.

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‡ Courses 9–15 are primarily for Graduates, and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

Three hours. Third Term. Sophomore, Junior, or Senior year. Must be preceded by Political Science 1 and Economics 1. Required of candidates for the degree of Bachelor of Arts; elective for others who have credit for Political Science 1 and Economics 1. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Mon., Wed., Fri., at 12.20.*

2. *Social Institutions, Conditions, and Problems*

Historical development of domestic, religious, and political institutions; study of such social problems as charity, crime, intemperance, marriage, and divorce, etc. *Professors* WILSON *and* DEALEY.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

3. *Origin and Development of Society*

The formation of human institutions and their subsequent modifications. *Professor* WARD.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

4. *Social Philosophy*‡

The relation of sociology to other sciences, especially its psychic aspects, and the interpretation of social phenomena. *Professor* WARD.

Three hours. First and Second Terms. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

5. *Application of Sociological Principles*‡

The utility of sociology as the basis of legislation and of the social art. The improvement of society through conscious effort. *Professor* WARD.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

6. *Sociological Aspects of Education*§

The social importance of intellectual development and of the diffusion of knowledge. *Professor* WARD.

Three hours. Through the year. Elective for Graduates.

8. *Demography*§

Dispersion of races; social study of race characteristics; emigration, immigration, etc. *Professor* WILSON.

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‡ Courses 4 and 5 form a single course continuous through the year.

§ Courses 6–9 are primarily for Graduates and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

Three hours. One term. Offered if applied for by Graduates.

9. *Development of Social Theory*‡

Traces important theories, ancient and modern, in regard to social conditions and development. *Professor* DEALEY.

Three hours. One term. Offered if applied for by Graduates.

7. *Current Social Theory and Practice*‡

A seminary course. *Professors* WILSON *and* DEALEY.

One hour. Through the year. Elective for Graduates.

PHYSICAL TRAINING

FREDERICK WILLIAM MARVEL, PH.B., *Professor of Physical Training*

From the close of the Thanksgiving recess to the end of the second term, all first and second year students are required to attend gymnasium exercises three times a week as follows:

FRESHMEN. *1st div. Tu., Fri., Sat., at 10.20 ; 2d div. Mon., Tu., Th., at 4.20.*

SOPHOMORES. *1st div. Mon., Wed., Th., at 10.20; 2d div. Tu., Th., Fri., at 3.20.*

A voluntary class for Juniors and Seniors will be held on *Mon., Tu., Th., Fri., at 5.10.*

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‡ Courses 6–9 are primarily for Graduates and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

PRINCIPAL CHANGES IN COURSES

FOR 1907-8 AS COMPARED WITH 1906-7

Art. 7, 9, not offered. 12, offered.

Biblical Literature. 13, 17, 18; 16, not offered. 14, 19, 20, offered.

Botany. 2, offered. 3, 4, 5, not offered. 7, new.

Chemistry. 18, 19, 20, offered. 21, 22; 23, not offered.

Comparative Anatomy. 9, not offered. 10; 16, offered.

Economics. 3; 8; 13, offered. 4; 9, not offered.

English. 3; 16; 22, offered. 24; 14; 17, not offered. 18; 50, new.

Geology. 12, offered. 4; 7; 10, not offered.

German. The courses as a whole have been reorganized, and a number of new courses added.

Greek. 7; 11; 34, offered. 9; 10; 33, not offered.

History. 8, 9, 10; 19, 20, 21, offered. 11, 12, 13; 17; 18; 25; 26, not offered. 1, extended through the year. 27, 28, 29, new.

Indo-European Philology. 1, offered.

Mathematics. 13, 22, not offered. 14; 23; 24; 26, offered.

Philosophy. 9, 10, now open to Juniors. 11, now open to Seniors. 16, not offered. 17, new.

Roman Literature and History. 7, 8, 9; 30; 31, 32, 33, offered. 10, 11, 12; 28, 29, not offered.

Romance Languages and Literatures. 8, 9, 10; 20, 21, 22; 41, 42, 43, offered. 32, 33, 34; 44, 45, 46, not offered. 50, new.

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BULLETIN
OF
BROWN UNIVERSITY

ANNOUNCEMENT OF COURSES
1908-1909

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UNIVERSITY OF ILLINOIS

WOMEN'S COLLEGE EDITION

PROVIDENCE
PUBLISHED BY THE UNIVERSITY
[APRIL, MAY, JUNE, OCTOBER, DECEMBER, & FEBRUARY]

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ANNOUNCEMENT OF COURSES
OFFERED AT
THE WOMEN'S COLLEGE
IN
BROWN UNIVERSITY
1908–1909

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PROVIDENCE, RHODE ISLAND
PUBLISHED BY THE UNIVERSITY
1908

GENERAL ANNOUNCEMENTS
FOR
THE ACADEMIC YEAR
1908–1909

⁂

THE Academic Year begins with chapel service in Pembroke Hall, at 9 a.m., on Wednesday, September 23.

For information regarding Entrance Examinations, Registration and Enrolment of Undergraduates and Graduates, and Requirements for the various Degrees, see pages 6 to 16 of this Announcement. The following special announcements relate to the Women's College. Undergraduates must register at the Registrar's Office, in Pembroke Hall, between 9 a.m. and 12 m., or between 2 p.m. and 4 p.m., on September 21 and 22. Undergraduates in residence must return their registration cards to the Registrar not later than June 10. Graduate students register at the office of the Registrar of the University.

COURSES OF INSTRUCTION

*A FULL description of each course, with a statement of the conditions of admission to it, may be found on pages 17–89. Courses designated by a † are given at the University, and women are admitted to them, but only on the recommendation of the Dean. Women may also be admitted to other University courses not announced here, with the special permission of the department and with the consent of the Dean. Graduate courses are often open to approved Seniors. In courses designated by a * a final mark covering the work of the course as a whole will be given at the end of the course, the marks given at the end of the preceding term or terms being regarded as temporary.*

ART

1, 2, 3. *History of Art from Antiquity through the Renaissance*
Professor Poland.
Tu., Wed., Sat., at 9.25.

10. *Freehand Drawing*
Rhode Island School of Design.
Tu., or Th., or Fri., at 2.20.

11. *Practical Work in Art*
Rhode Island School of Design.
Tu., Th., Fri., at 2.20.

ASTRONOMY

1, 2, 3. *General Course*
Professor Upton.
Wed., Fri., Sat., at 11.25.

BIBLICAL LITERATURE AND HISTORY

1.† *Elementary Hebrew*

13, 17, 18. *Later Jewish and Early Christian History and Literature*
Professor Fowler.
Tu., Fri., Sat., at 10.25.

15.*† *Biblical Seminary*

BOTANY

1. *Introductory Course*
Professor Collins.
Tu., Wed., Sat., 9.20 to 11.20.
After the first term Botany 1 and Comparative Anatomy 1 are identical.

3, 4, 5.† *Cryptogams*

6.† *Investigation*

7.† *Trees*

CHEMISTRY

1, 2, 3. *Descriptive Chemistry*
Professor Bucher *and Mr.* Dolt.
Mon., Tu., Th., at 11.20.

4, 5.† *Qualitative Analysis*

6.† *Quantitative Analysis*

COMPARATIVE ANATOMY

2.† *Anatomy*

3, 4, 5.† *Bacteriology, General Histology, Special Histology*

7.† *Chemical Physiology*

8.† *Physical Physiology*

9.† *Anatomy of the Nervous System*

16.† *Evolution*

18.† *Ornithology*

20. *Euthenics*

Aims to teach the scientific facts and physiological and economic principles upon which *right living* depends. First term: the chemistry of foods and their physiological and economic value; food constituents, proteids, carbohydrates, fats, etc.; digestion and absorption; quantitative analysis of milk; selection and preparation of food; study of dietaries. Second term: the principles of general physiology and their application to personal hygiene; circulation, respiration, excretion, and reproduction; muscular and nervous action under varying conditions of stimulation, temperature, fatigue, etc. Third term: the principles of construction and practical management of the home necessary for the economy, health, and social efficiency of the individual occupants; demonstration of sanitary methods. Those who desire may substitute the first term's work in General Biology (22) for that of Euthenics (20). *Miss* Wilcox.

Three hours. Six hours of attendance. Through the year. Elective for all Undergraduates. *Mon. 10.25 to 12.15; Th. 10.25 to 12.15; Fri. 2.20 to 4.20.*

22. *General Biology*

Introductory to other courses in the department; also designed for those who, without intending to pursue the subjects further, desire a general view of biological work and biological theories, as variation, natural selection, evolution, and heredity. First term: practise in dissection; study of the structure and functions of the different organs of a typical mammal and comparisons with those of man. Second and third terms: use of compound microscope, study of the cell, protoplasm, tissues; metabolism, growth and reproduction in unicellular animals and plants; theories of fermentation, infection, vaccination, and immunity; more specialized forms, hydra, fern, annelid, lobster, and frog. Collecting trips in the spring. Those who desire may substitute the second and third terms of Euthenics (20) for those of General Biology (22). The classes in Botany (1) and General Biology (22) are combined the second and third terms. *Miss* WILCOX.

Three hours. Six hours of attendance. Through the year. Elective for undergraduates. *Tues., Wed., Sat., 9.25 to 11.15.*

ECONOMICS

1. *Elementary*

Dr. KIRK.

First Term. *Tu., Wed., Sat., at 9.25.*

12, 6, 7. *Industrial Life, The Labor Movement, Socialism*

Dr. KIRK.

Mon., Th., Fri., at 9.25.

4.† *Public Finance*

5.† *History and Present Tendencies of Economics*

9.† *The Tariff*

13.† *Physical and Commercial Geography*

20, 21, 22.† *Investigation of Special Topics*

ENGLISH

1. *Rhetoric and Composition*

Professor BENEDICT *and Messrs.* HARKNESS, ——, *and* ——.

Mon., Tu., Th., at 2.25.

4. *Argumentative Composition*
Professor HUNTINGTON.
Wed., Fri., Sat., at 11.25.

9.† *Old English*

10.† *Chaucer*
Courses 9 and 10 are open to a few selected students.

11. *English Literature from the Beginning to the Present Time*
Professor DAMON.
Mon., Tu., Th., at 3.25.

7.* *Public Speaking*
Professor CROSBY.
Tu., Fri., Sat., at 10.25.

13. *History of the Drama in England*
Professor POTTER.
Wed., Fri., Sat., at 11.25.

14. *Shakspere*
Professor BENEDICT.
Mon., Wed., Th., at 10.25.

19. *English Literature from 1798 to 1832*
Mr. HASTINGS.
Tu., Fri., Sat., at 10.25.

GEOLOGY

3.† *General Geology*

12.† *Physical and Commercial Geology*

13.† *Physiographic Seminary*

GERMANIC LANGUAGES AND LITERATURE

1. *Introductory Course*
Mr. MITCHELL.
Mon., Wed., Fri., at 12.25.

2. *Intermediate Course*
Mr. ——.
Mon., Wed., Fri., at 12.25.

3, 4, 5. *Reading Course*
Professor CROWELL *and Mr.* MITCHELL.
Tu., Th., Sat., at 12.25.

7. *Advanced Course in Standard Authors, Classical and Modern*
Professor VON KLENZE.
Mon., Wed., Fri., at 12.25.

10.† *Goethe's Faust: Parts* 1 *and* 2

12, 13, 14.† *Outline History of German Literature*

16.† *Gothic and Old High German*

29, 30, 31. *The German Drama of the Nineteenth Century*
Professor CROWELL.
Mon., Wed., Fri., at 12.25.

33, 34, 35.† *Goethe: A Study of His Life and Works*

36.† *Seminary in German Literature*

GREEK LITERATURE AND HISTORY

A, B, C. *Elementary Course*
Professors MANATT *and* ALLINSON.
Wed., Fri., Sat., at 11.25.

1. *Plato*
Professor MANATT.
First Term. *Tu., Wed., Sat., at 9.25.*

2. *Homer*
Professor ALLINSON.
Second Term. *Tu., Wed., Sat., at 9.25.*

3. *Lysias*
Professor Manatt.
Third Term. *Tu., Wed., Sat., at 9.25.*

4. *Lucian*
Professor Allinson.
First Term. *Mon., Tu., Th., at 11.25.*

35. *Greek Historians*
Professor Manatt.
Second Term. *Mon., Tu., Th., at 11.25.*

6. *Dramatic Poets*
Professor Allinson.
Third Term. *Mon., Tu., Th., at 11.25.*

11. *Herodotus*
Professor Manatt.
First Term. *Tu., Fri., Sat., at 10.25.*

12. *Thucydides*
Professor Manatt.
Second Term. *Tu., Fri., Sat., at 10.25.*

10. *The Drama*
Professor Allinson.
Third Term. *Tu., Fri., Sat., at 10.25.*

36. *Introduction to Greek Archeology*
Professor King.
Third Term. *Mon., Th., Fri., at 9.25.*

HISTORY

1. *Medieval and Modern History of Europe*
Mon., Tu., Th., at 11.25.

11, 12, 13. *English Constitutional and Political History since 1689*
Professor Munro.
Mon., Tu., Th., at 11.25.

22, 23, 24.† *Seminary in American History*

27, 28, 29. *American History*
Professor MacDonald.
Mon., Wed., Fri., at 12.25.

MATHEMATICS

3. *Algebra*
Professor Manning *and* ——.
First Term. *Tu., Wed., Fri., Sat., at 10.25.*

1. *Geometry, Solid and Spherical*
Professor Manning *and* ——.
Second Term. *Tu., Wed., Fri., Sat., at 10.25.*

2. *Trigonometry*
Professor Manning *and* ——.
Third Term. *Tu., Wed., Fri., Sat., at 10.25.*

4. *Analytic Geometry*
Professor Davis.
First and Second Terms. *Tu., Fri., Sat., at 10.25.*

5. *Differential Calculus*
Professor Davis.
Third Term. *Tu., Fri., Sat., at 10.25.*

6.† *Integral Calculus*

7.† *Applications of the Differential Calculus*

8.† *Applications of the Integral Calculus*

9, 10, 11.† *Differential Equations*

14.† *Solid Analytic Geometry*

MUSIC

1, 2, 3. *The Evolution of Modern Music*
Professor MacDougall.
Mon., Th., at 10.25.

PHILOSOPHY

2. *Psychology, introductory course*
Professor DELABARRE.
Tu., Wed., Sat., at 9.25.

9, 10. *Theoretical Ethics*
Professor EVERETT.
First and Second Terms. *Mon., Tu., Th., at 11.25.*

11. *Practical Ethics*
President FAUNCE.
Third Term. *Tu., Wed., Fri., at 10.25.*

12. *Philosophy of Religion*
Professor EVERETT.
Third Term. *Mon., Tu., Th., at 11.25.*

EDUCATION

Professor JACOBS

1. *History of Education*
First Term. *Mon., Wed., Th., at 10.25.*

2. *Critical Study of Modern Education*
Second Term. *Mon., Wed., Th., at 10.25.*

3. *Fundamental Principles of Education*
Third Term. *Mon., Wed., Th., at 10.25.*

4. *Psychology of Education*
First Term. *Mon., Th., Fri., at 9.25.*

5. *Hygiene of Education*
Second Term. *Mon., Th., Fri., at 9.25.*

6. *Practical Introduction to Teaching*
Third Term. *Mon., Th., Fri., at 9.25.*

PHYSICS

1, 2, 3. *Elementary Physics*
Professor Barus.
Wed., Fri., Sat., at 11.25.

4, 5, 6.† *Elementary Physics, continued*

7.† *Physical Measurements*

14, 15, 16.† *Advanced Laboratory Course*

17, 18, 19.† *Applied Harmonic Analysis and Applied Vector Analysis*

20, 21, 22.† *Physics, advanced course*

ROMAN LITERATURE AND HISTORY

1. *Livy*
Professor King.
First Term. *Mon., Th., Fri., at 9.25.*

2. *Cicero's Letters*
Professor Greene.
Second Term. *Mon., Th., Fri., at 9.25.*

3. *Tacitus's Germania and Agricola*
Professor Greene.
Third Term. *Mon., Th., Fri., at 9.25.*

4. *Horace's Odes and Epodes*
Professor Harkness.
First Term. *Mon., Th., Fri., at 9.25.*

5. *Catullus, Tibullus, and Propertius*
Professor King.
Second Term. *Mon., Th., Fri., at 9.25.*

6. *Satires of Horace*
Professor Harkness.
Third Term. *Mon., Th., Fri., at 9.25.*

10, 11, 12. *Latin Prose*
Professors Harkness *and* Greene.
Tu., Th., Sat., at 12.25.

22, 23, 24. *Latin Composition*
Professor Greene.
Fri. at 2.25.

ROMANCE LANGUAGES AND LITERATURES

1. *Elementary Course*
Professor Morse.
Mon., Tu., Th., at 11.25.

2, 3, 4. *Intermediate Course*
Professor Morse.
Wed., Fri., Sat., at 11.25.

5, 6, 7. *French Language and Literature*
Professor Johnson.
Tu., Wed., Sat., at 9.25.

11, 12, 13. *French Literature, exclusive of the Drama, since 1850*
Professor Johnson.
Wed., Fri., Sat., at 11.25.

14. *Composition*
M. Hénin.
Tu. at 12.25.

23, 24, 25. *The French Drama*
Professor Langdon.
Mon., Th., Fri., at 9.25.

26, 27, 28.† *Modern Italian*

35, 36, 37. *Dante in English*
Professor Langdon.
Wed., Fri., Sat., at 11.25.

38, 39, 40.† *Modern Spanish*

41, 42, 43.† *Spanish Literature*

SOCIAL AND POLITICAL SCIENCE

1. *Political Science, elementary*
Professor WILSON.
Second Term. *Tu., Wed., Sat., at 9.25.*

1. *Social Science, elementary*
Professor DEALEY.
Third Term. *Tu., Wed., Sat., at 9.25.*

2. *Social Institutions, Conditions, and Problems*
Professor DEALEY.
Tu., Th., Sat., at 12.25.

PHYSICAL TRAINING

Mrs. PAINE

From the close of the Thanksgiving Recess to March 12, all first and second year students are required to attend gymnasium classes three times a week, as follows:

SOPHOMORE DIVISION: *Mon., Tu., Th., 2.30 to 3.15.*
FRESHMAN DIVISION: *Mon., Tu., Th., 3.25 to 4.10.*

ANNOUNCEMENT OF COURSES
OFFERED IN
BROWN UNIVERSITY
1908-1909

PROVIDENCE, RHODE ISLAND
PUBLISHED BY THE UNIVERSITY
1908

CALENDAR 1908–1909

Vacations and holidays occurring within the academic year 1908–9 are indicated by dark type.

1908

JULY

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

AUG.

S	M	T	W	T	F	S
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9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

SEPT.

S	M	T	W	T	F	S
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6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

OCT.

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18	19	20	21	22	23	24
25	26	27	28	29	30	31

NOV.

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22	23	24	25	**26**	**27**	28
29	30					

DEC.

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27	**28**	**29**	**30**	**31**		

1909

JAN.

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3	**4**	**5**	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

FEB.

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14	15	16	17	18	19	20
21	**22**	23	24	25	26	27
28						

MAR.

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14	15	16	17	18	19	20
21	22	23	**24**	**25**	**26**	**27**
28	**29**	**30**	31			

APR.

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18	19	20	21	22	23	24
25	26	27	28	29	30	

MAY

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16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	**31**					

JUNE

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20	21	22	23	24	25	26
27	28	29	30			

1909

JULY

S	M	T	W	T	F	S
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25	26	27	28	29	30	31

AUG.

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29	30	31				

SEPT.

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26	27	28	29	30		

OCT.

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24	25	26	27	28	29	30
31						

NOV.

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21	22	23	24	25	26	27
28	29	30				

DEC.

S	M	T	W	T	F	S
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12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

THE UNIVERSITY CALENDAR 1908–1909

1908	
September 2.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
September 17–21.	*Thursday, Friday, Saturday, and Monday.* Examinations for admission to the Freshman class and to advanced standing.
September 22.	*Tuesday.* Last day for registration and enrolment of Undergraduate students.
September 23.	*Wednesday.* Academic Year begins (fourth Wednesday in September). Last day for registration of Graduate students.
October 3.	*Saturday.* Examination in Greek for the President's Premiums.
October 7.	*Wednesday.* Examination in Latin for the President's Premiums.
October 10.	*Saturday.* Examination in Mathematics for the Hartshorn Premiums.
October 14.	*Wednesday.* Examination in French for the President's Premiums.
November 26, 27.	*Thursday and Friday.* Thanksgiving Recess.
December 14–22.	*Monday to Tuesday.* Term examinations.
Dec. 23, 1908 to January 5, 1909.	*Wednesday to Tuesday.* Christmas Recess.
1909	
January 5.	*Tuesday.* Last day for enrolment of Undergraduate students.
January 6.	*Wednesday.* Second Term begins.
February 1.	*Monday.* Last day for applications of competitors for the Carpenter Prizes in Elocution.
February 22.	*Monday.* Washington's Birthday. No University exercises.
March 15–23.	*Monday to Tuesday.* Term examinations.

MARCH 24–30.	*Wednesday to Tuesday.* SPRING RECESS.
MARCH 30.	*Tuesday.* Last day for enrolment of Undergraduate students.
MARCH 31.	*Wednesday.* THIRD TERM BEGINS.
APRIL 1.	*Thursday.* Last day for receiving applications for examination for the degree of Doctor of Philosophy, or of Master of Arts *in absentia.*
APRIL 2.	*Friday.* Last day for receiving essays submitted in competition for the Gaston Prize Medal.
APRIL 30.	*Friday.* Last day for receiving theses of candidates for the degree of Doctor of Philosophy.
MAY 1.	*Saturday.* Last day for receiving applications for the Grand Army of the Republic Fellowship. Last day for receiving Commencement orations.
MAY 6.	*Thursday.* Carpenter Prize Speaking Contest.
MAY 13.	*Thursday.* Gaston Prize Medal Competition.
MAY 20.	*Thursday.* Hicks Prize Debate.
MAY 31.	*Monday.* Memorial Day. No University exercises.
JUNE 1.	*Tuesday.* Last day for examinations for advanced degrees.
JUNE 3–11.	*Thursday to Friday.* Term examinations.
JUNE 13.	*Sunday.* Baccalaureate Sermon, First Baptist Meeting House, 4.30 p.m.
JUNE 14.	*Monday.* Class Day.
JUNE 15.	*Tuesday.* Annual Meeting of the Phi Beta Kappa Society, Administration Building, 9.30 a.m. Ivy Day, Pembroke Hall. Annual Meeting of the Associated Alumni, Manning Hall, 2.30 p.m. Oration before the Associated Alumni, Sayles Memorial Hall, 4 p.m.
JUNE 16.	*Wednesday.* ONE HUNDRED AND FORTY-FIRST ANNUAL COMMENCEMENT (third Wednesday in June), First Baptist Meeting House, 10 a.m.
JUNE 17.	*Thursday.* Meeting of the Corporation.

June 17 to Sept. 21.	Summer Vacation.
September 1.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
Sept. 16–21.	*Thursday, Friday, Saturday, Monday, and Tuesday.* Examinations for admission to the Freshman class and to advanced standing.
September 20, 21.	*Monday and Tuesday.* Registration of new students.
September 21.	Enrolment of students previously in residence.
September 22.	*Wednesday.* Academic Year begins (fourth Wednesday in September).

ADMISSION TO THE UNIVERSITY

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METHODS OF ADMISSION TO THE FRESHMAN CLASS

I. ENTRANCE EXAMINATIONS CONDUCTED BY THE UNIVERSITY. Examinations for admission to the Freshman class are given by the University in September at the times and places indicated below. The University no longer offers entrance examinations in June; candidates desiring to be examined in June must take the examinations conducted under the supervision of the College Entrance Examination Board, for which see pages 7, 8. A candidate may, at his option, take all his examinations in June or in September, or he may take part in June and part in September. Before taking any examination conducted by the University, a candidate must present to the Registrar a letter of recommendation from the principal of his preparatory school and secure a card admitting him to the examination. This may be done by correspondence, provided that the written application and the recommendation are received not less than one week before the date of the first examination.

If a candidate offers subjects in excess of those required for admission, he may be examined in them at the times scheduled below and receive credit for them as college studies.

The order of the examinations in 1908 will be as follows:

Thursday, September 17
Algebra, 27 Wilson Hall, 8 a.m. to 10 a.m.
Plane Geometry, 27 Wilson Hall, 10 a.m. to 12 m.
Elementary French, 2 Wilson Hall, 1 p.m. to 3 p.m.
Advanced French, 2 Wilson Hall, 4 p.m. to 6 p.m.

Friday, September 18
Elementary Greek, 2 Wilson Hall, 8 a.m. to 10 a.m.
Advanced Greek, 2 Wilson Hall, 10 a.m. to 11.30 a.m.
Astronomy, 25 Wilson Hall, 8 a.m. to 10 a.m.
Physiography, 25 Wilson Hall, 10 a.m. to 12 m.
Elementary Latin, 25 Wilson Hall, 12.30 p.m. to 2.30 p.m.
Advanced Latin, 25 Wilson Hall, 2.30 p.m. to 4 p.m.
American History, 27 Wilson Hall, 4 p.m. to 6 p.m.

Saturday, September 19
English, 26 Wilson Hall, 8 a.m. to 10 a.m.
Chemistry, 2 Wilson Hall, 11 a.m. to 1 p.m.
Solid Geometry, 27 Wilson Hall, 2 p.m. to 4 p.m.
Plane Trigonometry, 27 Wilson Hall, 4 p.m. to 6 p.m.

MONDAY, SEPTEMBER 21
Elementary German, 2 Wilson Hall, 8 a.m. to 10 a.m.
Advanced German, 2 Wilson Hall, 10 a.m. to 12 m.
Greek and Roman History, 25 Wilson Hall, 1 p.m. to 3 p.m.
Physics, 1 Wilson Hall, 4 p.m. to 6 p.m.

TUESDAY, SEPTEMBER 22
English History, 25 Wilson Hall, 8 a.m. to 10 a.m.
Medieval and Modern History, 26 Wilson Hall, 10.30 a.m. to 12.30 p.m.

For students already pursuing courses in the University, entrance examinations are also given by the University at the close of the Christmas recess. Students desiring to take these examinations must file written applications with the Registrar before December 1. No student who has failed in an entrance examination will be granted a second examination at any time other than September, except on presentation of a tutor's certificate that he is prepared for such examination. No entrance examinations other than those appointed above will be held unless ordered by vote of the Committee on Registration and Attendance. For all examinations except those given in September a fee of two dollars is charged.

II. ENTRANCE EXAMINATIONS CONDUCTED BY THE COLLEGE ENTRANCE EXAMINATION BOARD. Examinations conducted under the supervision of the College Entrance Examination Board will be accepted in place of the corresponding examinations conducted by Brown University. In 1908 these examinations will be held June 15–20.

All applications for such examinations must be addressed to the Secretary of the College Entrance Examination Board, Post Office Sub-Station 84, New York, and must be made upon a blank form to be obtained from the Secretary of the Board upon application. Applications for examination at points in the United States east of the Mississippi River, also at Minneapolis, St. Louis, and other points on the Mississippi River, must be received by the Secretary of the Board on or before Monday, June 1, 1908; applications for examination elsewhere in the United States or in Canada must be received on or before Monday, May 25, 1908; and applications for examination at points outside the United States and Canada must be received on or before Monday, May 11, 1908. Applications received later than the dates named will be accepted when it is possible to arrange for the examinations of the candidates concerned, but only upon the payment of $5.00 in addition to the regular fee.

The examination fee is $5.00 for all candidates examined at points in the United States and Canada, and $15.00 for all candidates examined at points outside of the United States and Canada. The fee (which cannot be accepted in advance of the application) should be remitted by postal order, express order, or draft on New York, to the order of the College Entrance Examination Board.

A list of the places at which examinations are to be held by the Board in June is published about March 1. To receive proper consideration, requests that the examinations be held at particular points should be transmitted to the Secretary of the Board not later than February 1.

REGISTRATION AND ENROLMENT OF UNDERGRADUATES

REGISTRATION. In September of each year all *new students*, whether candidates for a degree or special students, must report at the Administration Building between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first term, and fill out registration cards for the whole of the ensuing year. Failure to comply with this rule will be treated as late registration and a fee of three dollars will be charged. All new students must present at or before the time of registration all credentials necessary for admission either as candidates for a degree or as special students.

In May of each year all *Undergraduates in residence*, whether candidates for a degree or special students, must obtain at the Registrar's office registration cards for the next year; these cards must be filled out by the students themselves with a statement of the courses elected for the whole of the ensuing year, and returned not later than June 1. Failure to comply with this rule will be treated as late registration and a fee of three dollars will be charged.

Courses bearing a single number must be elected as a whole. When term courses are grouped in one paragraph (*e. g.* Astronomy 1, 2, 3), the second term may not be taken without the first, nor the third without the second, unless specific statement to the contrary is made. In starred courses a final mark covering the work of the course as a whole will be given at the end of the course, the marks given at the end of the preceding term or terms being regarded as temporary. Changes in registration will be allowed only on presentation of sufficient reasons to the Committee on Registration and Attendance. Requests for permission to make changes in September must be presented to the committee between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first term. Requests for permission to make changes for the second or third term must be presented to the committee before the beginning of the examinations of the first and second terms respectively, unless the requests be the result of failure in those examinations, in which case they must be presented in writing to the Registrar two days before the opening of the second and third terms respectively.

ENROLMENT. In September all students whose registration cards have been already approved must report at the Registrar's office between 10 a.m. and 5 p.m. on the day preceding the opening of the first term and have their names checked as enrolled for the term. Failure to report will be treated as late enrolment and a fee of three dollars will be charged.

At the beginning of the second and third terms all Undergraduates must report at the Registrar's office between 10 a.m. and 5 p.m. on the day preceding the opening of the term and have their names checked as enrolled for the term. Failure to report will be treated as late enrolment and a fee of three dollars will be charged.

GRADUATE STUDENTS

Graduate students will report to the Dean of the Graduate Department in No. 5 Wilson Hall between 9 a.m. and 1 p.m. or between 3 and 5 p.m. on the Monday or Tuesday preceding the opening of the first term.

GUARANTEE

Every student, with the exceptions noted below, must present at or before his registration for the first term of the year the following guarantee, properly signed and witnessed. The guarantor must be the parent or guardian, or some other responsible person.

> *In consideration of the admission of*
> *as a student in Brown University, I hereby guarantee and promise to pay to said University all dues for rent, tuition, and incidental and other expenses properly chargeable to said as such student, as and when the same shall respectively become payable.*

A student paying the full room charges for the year at or before his registration for the first term, and the tuition and other charges for each term at or before his registration for that term, will not be required to present a guarantee.

NOTES

When the time of recitation is not given in connection with the announcement of the courses, the hours will be arranged with the instructors at the beginning of the term.

Members of the Senior Class who are candidates for the degree of Bachelor of Science in Civil Engineering are required to hand the subjects of their theses to the Professor of Civil Engineering on or before October 31, 1908.

Students desiring to rent rooms or to obtain room-mates should apply to the Registrar.

For official notices students should consult the bulletin boards in the north corridor of University Hall or in the Administration Building.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ARTS

I. PRESCRIBED SUBJECTS

Ancient Languages (either Latin or Greek, or both). Six hours. At least three hours must be taken in the Freshman year, and the whole six hours must be completed by the end of the Sophomore year.

Modern Languages (either French or German, or both). Six hours. At least three hours must be taken in the Freshman year, and the whole six hours must be completed by the end of the Sophomore year.

Students presenting German only must take elementary French. Students presenting French only must take elementary German. Students presenting elementary French only must continue French in the Freshman year and take elementary German in either the Freshman or the Sophomore year. Students presenting elementary German only must continue German in the Freshman year and take elementary French in either the Freshman or the Sophomore year. Students presenting elementary French and elementary German only must continue both languages, but may postpone the continuation of one language to the Sophomore year. Students presenting elementary work in one language and elementary and advanced work in the other must take in the Freshman year the language in which the elementary work only was presented. Students presenting elementary and advanced work in both languages may take the required six hours in either French or German, or both.

Mathematics. Four or five hours. Freshman year. Four hours for students not presenting Solid Geometry and Plane Trigonometry. Five hours for students presenting Solid Geometry and Plane Trigonometry.

English. Rhetoric and Composition. Three hours. Freshman year.

European History. Three hours. Sophomore or Junior year.

English Literature. Any one of the courses in English from 10 to 23 inclusive. Sophomore, Junior, or Senior year.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Social Science, Economics, and Political Science. One three-hour, one-term course in each of the three departments. Sophomore, Junior, or Senior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year. The courses in Education cannot be taken to satisfy this requirement.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. *Required Studies.*

Latin 1, 2, 3 or *Greek* 1, 2, 3. Three hours.

French 1 or 2, 3, 4 or *German* 1 or 2. } Three hours.

Mathematics 3, 1, 2. Four hours; or

Mathematics 4, 5; 15, 16. Five hours.

English 1. Three hours.

II. *Elective Studies.*

One three-hour course running through the year must be chosen from the following list:

Latin 1, 2, 3. For students presenting elementary and advanced Latin for admission.

Greek A, B, C. For students not presenting Greek for admission.

Greek 1, 2, 3. For students presenting elementary and advanced Greek for admission.

French 1. For students not presenting French for admission.

French 2, 3, 4. For students presenting elementary French for admission.

French 5, 6, 7. For students presenting advanced French for admission.

German 1. For students not presenting German for admission.

German 2. For students presenting elementary German for admission.

German 7. For students presenting advanced German for admission.

Greek 34, *Latin* 30, *Indo-European Philology* 1. (*Greek and Roman Literature and the History of Language.*) For all students.

Chemistry 1, 2, 3. For all students.

Chemistry 4, 5, 6. For students presenting Chemistry for admission. (Subject to the consent of the department.)

Botany 1 or *Comparative Anatomy* 1. For all students.

SOPHOMORE YEAR

I. That portion of the required work in ancient and modern languages not completed in the Freshman year.

II. Other required and elective courses sufficient with those taken under I to make fifteen hours a week.

JUNIOR YEAR

I. The required History and Physical or Natural Science, if not previously taken.

II. Other required and elective courses sufficient with those taken under I to make fifteen hours a week.

SENIOR YEAR

I. All required courses not previously taken.

II. Elective courses sufficient with those taken under I to make fifteen hours a week.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF PHILOSOPHY

I. PRESCRIBED SUBJECTS

Modern Languages. An amount sufficient with the work presented for admission to complete the elementary course and a year of advanced work in both French and German. A student who is admitted in both advanced French and advanced German is required to continue one of these languages for one year, three hours a week.

Mathematics. Four or five hours. Freshman year. Four hours for students not presenting Solid Geometry and Plane Trigonometry. Five hours for students presenting Solid Geometry and Plane Trigonometry.

English. Rhetoric and Composition. Three hours. Freshman year.

European History. Three hours. Sophomore or Junior year.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year. The courses in Education cannot be taken to satisfy this requirement.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. *Required Studies.*

English 1. Three hours.

French 1 or 2, 3, 4 or } Three hours.
German 1 or 2. }

Mathematics 3, 1, 2. Four hours; or

Mathematics 4, 5; 15, 16. Five hours.

II. *Elective Studies.*

Two three-hour courses running through the year must be chosen from the following list:

Latin 1, 2, 3. For students presenting elementary and advanced Latin for admission.

Greek A, B, C. For students not presenting Greek for admission.

Greek 1, 2, 3. For students presenting elementary and advanced Greek for admission.

French 1. For students not presenting French for admission.

French 2, 3, 4. For students presenting elementary French for admission.

French 5, 6, 7. For students presenting advanced French for admission.

German 1. For students not presenting German for admission.

German 2. For students presenting elementary German for admission.

German 7. For students presenting advanced German for admission.

Greek 34, *Latin* 30, *Indo-European Philology* 1. (*Greek and Roman Literature and the History of Language.*) For all students.

Chemistry 1, 2, 3. For all students.

Chemistry 4, 5, 6. For students presenting Chemistry for admission. (Subject to the consent of the department.)

Botany 1 or *Comparative Anatomy* 1. For all students.

Mechanical Drawing 2, 3. For all students.

SOPHOMORE YEAR

I. That portion of the required work in modern languages not completed in the Freshman year.

II. Other required and elective courses sufficient with those taken under I to make fifteen hours a week.

JUNIOR YEAR

I. The required History and Physical or Natural Science, if not previously taken.

II. Other required and elective courses sufficient with those taken under I to make fifteen hours a week.

SENIOR YEAR

I. All required courses not previously taken.

II. Elective courses sufficient with those taken under I to make fifteen hours a week.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN CIVIL ENGINEERING

FRESHMAN YEAR

First Term	*Second Term*	*Third Term*
Mathematics 17	Mathematics 18	Mathematics 19
Mech. Drawing 1	Mech. Drawing 1	Mech. Drawing 1
Civil Engineering 1	Civil Engineering 2	Civil Engineering 3
English 1	English 1	English 1
French 2 or German 2	French 3 or German 2	French 4 or German 2

SOPHOMORE YEAR

Mathematics 20	Mathematics 21	Mathematics 21
Civil Engineering 4	Civil Engineering 5	Civil Engineering 6
Physics 1	Physics 2	Physics 3

SOPHOMORE YEAR [Cont.]

First Term	*Second Term*	*Third Term*
‡Political Science 1	‡Economics 1	‡Social Science 1
	Civil Engineering 7	§Civil Engineering 8
	Civil Engineering 9	Civil Engineering 10

Also, of the following courses, the subject not presented for admission:

Chemistry 1	Chemistry 2	Chemistry 3
French 1	French 1	French 1
German 1	German 1	German 1

JUNIOR YEAR

Civil Engineering 11	Civil Engineering 12	Civil Engineering 19
Mechanics 1	Mechanics 1	Mechanics 3
Astronomy 4	Astronomy 5	
Physics 24	Physics 24	Physics 24
Elect. Engineering 1	Elect. Engineering 2	Civil Engineering 15
Geology 17	Civil Engineering 14	Geology 16

SENIOR YEAR

Civil Engineering 23		Civil Engineering 17
Civil Engineering 25	Civil Engineering 29	Civil Engineering 18
Civil Engineering 26	Civil Engineering 27	Civil Engineering 28
Civil Engineering 35	Civil Engineering 35	Civil Engineering 24
Mech. Engineering 22	Mech. Engineering 22	Civil Engineering 36
Mechanics 2	Mechanics 2	Civil Engineering 32
Civil Engineering 13	Civil Engineering 30	Civil Engineering 34
	Civil Engineering 31	Botany 7

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

FRESHMAN YEAR

First Term	*Second Term*	*Third Term*
Mathematics 17	Mathematics 18	Mathematics 19
Mech. Drawing 1	Mech. Drawing 1	Mech. Drawing 1
Civil Engineering 1	Civil Engineering 2	Civil Engineering 3
English 1	English 1	English 1
French 2 or German 2	French 3 or German 2	French 4 or German 2

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‡ Or some other three-term course, in the Department of English, or History, or Philosophy, chosen with the approval of the head of the Department of Civil Engineering.

§ Civil Engineering 8 is taken during the spring recess.

SOPHOMORE YEAR

First Term	*Second Term*	*Third Term*
Mathematics 20	Mathematics 21	Mathematics 21
Mech. Drawing 4	Mech. Drawing 5	Mech. Engineering 8
Physics 1	Physics 2	Physics 3
‡ Political Science 1	‡ Economics 1	‡ Social Science 1
	Mech. Engineering 1	Mech. Engineering 3

Also, of the following courses, the subject not presented for admission:

Chemistry 1	Chemistry 2	Chemistry 3
French 1	French 1	French 1
German 1	German 1	German 1

JUNIOR YEAR

Mechanics 1	Mechanics 1	Mechanics 3
Mech. Engineering 4	Mech. Engineering 5	
Mech. Engineering 9	Mech. Engineering 10	Mech. Engineering 11
Physics 24	Physics 24	Physics 24
Elect. Engineering 1	Elect. Engineering 2	Elect. Engineering 3
Elect. Engineering 7	Elect. Engineering 8	Elect. Engineering 9

SENIOR YEAR

Mechanics 2	Mechanics 2	Civil Engineering 17
Mathematics 9	Elect. Engineering 11	§ Physics 19
Elect. Engineering 4	Elect. Engineering 5	Elect. Engineering 6
Physics 23	Physics 23	Physics 23
Elect. Engineering 10	Elect. Engineering 12	Elect. Engineering 13
		Civil Engineering 32
Elect. Engineering 14	Elect. Engineering 14	Elect. Engineering 14

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

FRESHMAN YEAR

First Term	*Second Term*	*Third Term*
Mathematics 17	Mathematics 18	Mathematics 19
Mech. Drawing 1	Mech. Drawing 1	Mech. Drawing 1
Civil Engineering 1	Civil Engineering 2	Civil Engineering 3
English 1	English 1	English 1
French 2 or German 2	French 3 or German 2	French 4 or German 2

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‡ Or some other course, not technical, chosen with the approval of the head of the Department of Electrical Engineering.

§ Or an equivalent.

SOPHOMORE YEAR

First Term	*Second Term*	*Third Term*
Mathematics 20	Mathematics 21	Mathematics 21
Mech. Drawing 4	Mech. Drawing 5	Mech. Engineering 8
Physics 1	Physics 2	Physics 3
‡ Political Science 1	‡ Economics 1	‡ Social Science 1
	Mech. Engineering 1	Mech. Engineering 2

Also, of the following courses, the subject not presented for admission:

Chemistry 1	Chemistry 2	Chemistry 3
French 1	French 1	French 1
German 1	German 1	German 1

JUNIOR YEAR

Mech. Engineering 19	Mech. Engineering 20	Mech. Engineering 21
Mech. Engineering 16	Mech. Engineering 17	Mech. Engineering 18
Mech. Engineering 3	Mech. Engineering 4	
Mech. Engineering 9	Mech. Engineering 10	Mech. Engineering 11
Mechanics 1	Mechanics 1	Mechanics 3
Physics 7	Physics 7	Physics 7

SENIOR YEAR

Mech. Engineering 22	Mech. Engineering 22	
Mech. Engineering 5	Mech. Engineering 6	
Mech. Engineering 12	Mech. Engineering 13	Mech. Engineering 14
Mechanics 2	Mechanics 2	Mech. Engineering 15
Elect. Engineering 1	Elect. Engineering 2	Elect. Engineering 3
Mech. Engineering 23	Mech. Engineering 24	Civil Engineering 32
Mech. Engineering 25	Mech. Engineering 25	Mech. Engineering 25

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‡ Or some other course, in the Department of English, or History, or Philosophy, chosen with the approval of the head of the Department of Mechanical Engineering.

COURSES OF INSTRUCTION

IN every department the courses that bear a single number must be elected as a whole. When term courses are grouped in one paragraph (e.g. *Astronomy 1, 2, 3*), *the second term may not be taken without the first, nor the third without the second, unless specific statement to the contrary is made. In starred courses a final mark covering the work of the course as a whole is given at the end of the course, the marks given at the end of the preceding term or terms being regarded as temporary. When the time of meeting is not announced, it will be arranged with the instructor at the beginning of the term.*

I. ART ‡

WILLIAM CAREY POLAND, A.M., LITT. D., *Professor of the History of Art*

1, 2, 3. *History of Art from Antiquity through the Renaissance*

First term, ancient art; a general course in the history of ancient art, chiefly Greek. Second term, Roman, early Christian, and Medieval art; a study of Roman, Romanesque, and Gothic art, with some notice of Byzantine, Arabian, and Oriental art. Third term, art of the Renaissance; the fifteenth and sixteenth centuries; the effect on art of the dominant motives of the epoch, the development of art in the different countries of Europe, the great masters and their most significant works. Text-book, lectures, lantern views.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Wed., Th., at 10.20.*

4, 5. *Modern Art*

First term, the seventeenth and eighteenth centuries. Second term, the nineteenth century. Text-book, lectures, special assigned topics, lantern views.

Three hours. First and Second Terms. Elective for Juniors, Seniors, and Graduates, who have credit for 3. *Tu., Th., Sat., at 12.20.*

6. *Theory and Criticism of the Fine Arts*

A study of the more important facts and laws of artistic production. Text-book, special assigned topics, illustrated lectures.

Three hours. Third Term. Elective for students who have credit for any course in Art. *Tu., Th., Sat., at 12.20.*

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‡ For a statement of the courses in Music given in connection with this department, see page 88.

7. *Seminary in Classical Architecture*

Critical study; reading of Vitruvius in Latin; discussion of the principles followed by the Greek and Roman architects, and of the influence of Vitruvius upon the Renaissance.

Three hours. Second and Third Terms. Elective for Graduates. Offered only if three or more elect the course. It is advised that applications be made to Professor Poland at an early date.

[8. *Seminary in Greek and Roman Sculpture*]

An archeological course based on Overbeck's *Schriftquellen.*

Three hours. Through the year. Elective for Graduates who read Greek and Latin. Not offered in 1908–9.

9. *Seminary Study of the Acropolis of Athens*

Critical reading, in Greek, of Pausanias's account of the Acropolis of Athens; lectures and illustrations.

Three hours. First Term. Elective for Graduates who read Greek and Latin. Offered only if three or more elect the course. It is advised that applications be made to Professor Poland at an early date.

10. *Freehand Drawing*

Training of hand and eye by progressive study of models of machine parts, casts of ornamental forms, and still-life objects.

One hour. Two hours of drawing. Through the year. Elective for all students. Given at the Rhode Island School of Design. *Tu., or Th., or Fri., at 2.20.*

11. *Practical Work in Art*

Six hours of drawing or other practical work. To illustrate the principles of delineation, color, and chiaroscuro, and the principles of design in architecture, sculpture, and painting, as exemplified in the historic forms of art.

Three hours. Through the year. Elective for students who have credit for 10, and who have taken or are taking 1, 2, 3. Given at the Rhode Island School of Design. *Tu., Th., Fri., at 2.20.*

[12. *Seminary in Renaissance Art*]

Critical study of the art of the fifteenth and sixteenth centuries, particularly Italian. A more detailed study of the spiritual conditions, the influences, and the masters, than in *3.*

Three hours. Through the year. Elective for Graduates who have credit for 3. Not offered in 1908–9.

II. ASTRONOMY

WINSLOW UPTON, A.M., SC.D., *Professor of Astronomy*
FREDERICK SLOCUM,† PH.D., *Assistant Professor of Astronomy*

1, 2, 3. *General Course*

Fundamental conceptions of the science; methods of professional study; present state of our knowledge of the heavenly bodies. Young's *Manual of Astronomy.* Designed either for purposes of general culture or as a preparation for technical work. *Professor* UPTON.

Three hours. Through the year. Elective for Juniors and Seniors who have credit for Mathematics 3, 1, 2. *Tu., Th., Fri., at 3.20.* Observations at Ladd Observatory.

4, 5. *Geodetic Astronomy*

Application of astronomy to geodesy; the problems of time, latitude, longitude, and azimuth. Computations and observations. *Professor* UPTON.

Three hours. First and Second Terms. Required of engineering students. Elective for Juniors and Seniors who have credit for Mathematics 3, 1, 2. May be taken at the same time as 1, 2, 3. *Mon., Tu., Th., at 2.20.* Observations at Ladd Observatory. Followed in the Third Term by Civil Engineering 15, *Geodesy.*

[7, 8, 9. *Nautical Astronomy*]

Principles of navigation; methods of determining the position of a ship at sea; use of sextant, compass, and chart for determining latitude, longitude, bearings, and courses. *Professor* SLOCUM.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for Mathematics 3, 1, 2. May be taken at the same time as 1, 2, 3. Not elective for students who have taken or are taking 4, 5, 6. Not offered in 1908–9.

10, 11, 12. *Practical Astronomy*

Advanced study of geodetic applications of astronomy; method of least squares. Doolittle's *Practical Astronomy,* with instrumental observations. *Professor* UPTON.

Three hours. Through the year. Elective for Graduates, and for Undergraduates who have shown special aptitude for instrumental observations.

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† On leave of absence during the academic year 1908–9.

13, 14, 15. *Special Advanced Work*

Subjects selected to meet the requirements of individual students. *Professors* UPTON *and* SLOCUM.

Three hours. Through the year. Elective for Graduates.

III. BIBLICAL LITERATURE AND HISTORY‡

HENRY THATCHER FOWLER, PH.D., *Professor of Biblical Literature and History*

HENRY ENGLANDER, A.M., *Lecturer on Biblical Literature and History*

LANGUAGES

1. *Elementary Hebrew*

Grammar; exercises in writing Hebrew; translation of parts of Genesis and Deuteronomy. *Professor* FOWLER *and Mr.* ENGLANDER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

2. *Historical Hebrew*

Reading of the books of Samuel and Kings with special attention to the acquisition of a vocabulary; review of the elements of Hebrew grammar and study of syntax. *Professor* FOWLER *and Mr.* ENGLANDER.

Three hours. Through the year. Elective for students who have credit for 1.

3. *Hebrew Literature*

Legal literature. Critical translation of the legal books of the Old Testament and study of the development of Israel's law codes. In succeeding years corresponding courses in the Prophetic, Psalm, and Wisdom literature of the Old Testament will be offered. *Professor* FOWLER.

Three hours. Through the year. Elective for Graduates and approved Undergraduates.

4. *Textual Criticism of the Old Testament*

The principles and method of textual criticism, in connection with the study of one of the shorter prophetical books. *Mr.* ENGLANDER.

Three hours. One term. Offered if applied for by Graduates.

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‡ For conditions under which students may receive credit in the Newton Theological Institution for work done in this department, see the Catalogue.

5. *Biblical Aramaic*

Grammar and reading of the Aramaic portions of the Old Testament. *Mr.* ENGLANDER.

Three hours. One term. Offered if applied for by students who have credit for 1.

6. *Elementary Arabic*

Grammar; exercises in writing Arabic; translation of prose selections. *Professor* FOWLER.

Two hours. Through the year. Elective for Seniors and Graduates.

[7, 8, 9. *Gospels and Epistles*]

First term, the Johannine writings; Second term, the Gospel of Mark and the First Epistle of Peter; Third term, the Gospels of Matthew and Luke. First and second terms, *Professor* FOWLER. Third term, *Professor* ALLINSON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. Not offered in 1908–9.

10, 11, 12. *Acts and Pauline Epistles*

Characteristics of Hellenistic Greek; translation, and investigation of date, authorship, and thought. First term, Acts; Second term, Thessalonians and Galatians; Third term, Corinthians and Romans. If desired by the class, translation from the writings of Justin Martyr may be substituted for the specified reading of the third term. First and second terms, *Professor* FOWLER. Third term, *Professor* ALLINSON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Tu., Th., at 2.20.*

LITERATURE AND HISTORY IN ENGLISH

13, 17, 18. *Old Testament Literature and History*

First term, early Semitic history, the formative age of Hebrew history, and Hebrew literature before the Monarchy. Second term, history and literature of the Hebrew Monarchy. Third term, Jewish history and literature from the Captivity to the Maccabean Revolt. Includes nearly the entire Old Testament history and literature. In connection with 14, 19, 20, gives a comprehensive view of Biblical history and literature. The Biblical books are read in the best English translations. *Professor* FOWLER.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

[14, 19, 20. *New Testament Literature and History*]

First term, the Maccabean and Roman ages of Jewish history and literature. Second term, the four Gospels and the life of Christ. Third term, the Acts, Epistles, Apocalypse, and the history of the Apostolic age. Includes a large part of the Jewish writings from the second century B.C. to the fall of Jerusalem, and the entire New Testament history and literature, studied in its Jewish setting. In connection with 13, 17, 18, gives a comprehensive view of Biblical history and literature. The books are read in the best English translations; no knowledge of the original languages is required. *Professor* FOWLER.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Each term may be elected independently. Not offered in 1908–9.

15.* *Biblical Seminary*

Subject for 1908–9: Documentary analysis of the Old Testament historical books. *Professor* FOWLER.

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors.

16. *Principles of Historical Criticism and Research*

This course is the same as course 25 offered by the Department of History. *Professor* MACDONALD.

One hour. One Term. Elective for Graduates of one year's standing. Required of all candidates for the degree of Doctor of Philosophy in Biblical Literature and History.

IV. BOTANY ‡

JAMES FRANKLIN COLLINS, PH.B., *Assistant Professor of Botany*

1. *Introductory Course*

Introductory to other courses in the department; also designed for those who, without intending to pursue the subject further, desire a general view of biological work and biological theories. Aims to give an introduction to laboratory methods of dissection and experiment and the use of the microscope, to afford a general view of the structure and functions of plants and animals, and to present an outline of the more important biological theories, such as evolution, natural selection, variation, mutation, and heredity. After the first term Botany 1 and Comparative Anatomy 1 are identical and the classes are combined.

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‡ Students intending to teach or to apply for positions in the government or state experiment station service are advised to supplement courses 1, 2 and 3, 4, 5 with advanced or special work in course 6.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. *Mon., Tu., Th., 2.20 to 4.20.*

[2.* *Morphology and Physiology*]

Minute structure and special functions of plants, and their tissues; embryology; classification; glycerin and paraffin technic, etc. The work of the third term can be arranged to meet the more special needs of students intending to take up either medicine or forestry. Certain portions of this course may, with the approval of the instructor, be continued by Juniors, Seniors, and Graduates, in course 6.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for 1, and for approved Graduates. Not offered in 1908–9. To be offered in 1909–10. Alternates with 3, 4, 5.

3, 4, 5. *Comparative Morphology*

Intended to give a general view of the evolution and classification of plants by a comparative study of the life-histories of certain types. First term, algae and fungi; Second term, mosses, ferns, etc.; Third term, seed plants. Certain portions of this course may, with the approval of the instructor, be continued by Juniors, Seniors, and Graduates, in course 6.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for 1, and for approved Graduates. Not to be offered in 1909–10. Alternates with 2. *Mon., Wed., Fri., at 12.20.*

6.* *Special Course*

Arranged to meet the requirements of individual students. May be taken in successive years if previous work is not duplicated. Students electing this course must definitely plan it, in consultation with the instructor, before June 1 of the preceding academic year. Advanced, special, or research work upon almost any phase of botany may be chosen by students who are properly qualified.

One to three hours. Through the year. Two to six hours of attendance for approved Juniors and Seniors. Primarily for Graduates, who may, with the consent of the instructor, elect the course for more than three hours.

7. *Trees*

Lectures and field work in the identification of native and introduced trees; characteristic structure of the more common kinds of wood. The required field trips will take place in the afternoon unless otherwise specially arranged, the number depending somewhat upon the length of the individual trips and the amount of work accomplished.

One hour. Two hours of attendance. Third Term. Required in the Senior year for the degree of Bachelor of Science in Civil Engineering. Elective for other Undergraduates. Lectures, *Wed. at 8.*

V. CHEMISTRY

John Howard Appleton, A.M., Sc.D., *Newport-Rogers Professor of Chemistry*

John Emery Bucher, Ph.D., *Associate Professor of Organic Chemistry*

Maurice Louis Dolt, Sc.M., *Instructor in Chemistry*

Frederick George Keyes, Sc.M., *Assistant in Chemistry*

Walter Clifton Slade, Ph.B., *Assistant in Chemistry*

1, 2, 3. *Descriptive Chemistry*

Non-metals; metals, their metallurgy, compounds, and practical applications; theoretical chemistry. Lectures with experiments; written exercises; individual laboratory work. *Professor* Bucher, *Messrs.* Dolt, Keyes, *and* Slade.

Three hours. Through the year. Elective for Undergraduates. *1st div. Mon., Th., at 10.20; 2d div. Tu., Fri., at 10.20; 3d div. Wed., Sat., at 11.20.* Laboratory hours to be arranged with the instructor.

4, 5. *Qualitative Analysis*

First term, properties of the metallic elements; their separation from certain of their compounds. Laboratory work; recitations in qualitative analysis and in chemical philosophy; exercises in stoichiometry. Second term, the principal non-metals and the acids formed by them; methods of separation and recognition of acids and acid radicles. *Professor* Appleton *and Mr.* Gager.

Three hours. Six hours of attendance. First and Second Terms. Elective for Juniors who have credit for 1, 2, 3. *1st div. Fri. at 11.20; 2d div. Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

6. *Quantitative Analysis*

Quantitative precipitations and separations of the most important elements and compounds; the principles upon which quantitative apparatus is constructed; chemical philosophy and stoichiometry continued. Chiefly laboratory work. *Professor* APPLETON *and Mr.* GAGER.

Three hours. Six hours of attendance. Third Term. Elective for Juniors who have credit for 4, 5. *1st div. Fri. at 11.20; 2d div. Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

7, 8, 9. *Quantitative Analysis, advanced course*

Assaying of metallic ores; analysis of agricultural materials; testing of chemicals used in textile establishments, etc. *Professor* APPLETON *and Mr.* GAGER.

Six hours. Twelve hours of attendance. Through the year. Elective for Seniors and Graduates who have credit for 6. Laboratory hours to be arranged with the instructor.

10, 11, 12. *Organic Chemistry*

Preparation and analysis of representative organic compounds. Lectures, recitations, and laboratory work. *Professor* BUCHER *and Mr.* DOLT.

Six hours. Through the year. First and second terms, three lectures a week and three laboratory periods a week. Elective for approved Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

13. *Assaying*

Professor APPLETON *and Mr.* GAGER.

Six hours. Twelve hours of attendance. Third Term. Elective for Seniors and Graduates who have credit for 1–6.

14. *Organic Dyes*

The chemistry and use of mordants, dyes, etc. *Professor* APPLETON *and Mr.* GAGER.

Six hours. Twelve hours of attendance. Third Term. Elective for approved Seniors and Graduates.

15, 16, 17. *Industrial Chemistry*

Lectures and laboratory work. *Professor* APPLETON.

Three to six hours. Six to twelve hours of attendance. Through the year. Elective for approved Graduates. Each term may be elected independently.

[18, 19, 20. *Physical Chemistry*]

Lectures and laboratory work. *Professor* Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates. Not offered in 1908–9.

21, 22. *Organic Chemistry, advanced course*

Professor Bucher.

Three hours. First and Second Terms. Elective for approved Graduates.

23. *Inorganic Chemistry, advanced course*

Professor Bucher.

Three hours. Third Term. Elective for approved Juniors, Seniors, and Graduates.

24, 25, 26. *Organic Preparations, advanced course*

Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

27, 28, 29. *Inorganic Preparations, advanced course*

Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates, who have credit for 10, 11, 12.

30, 31, 32. *Research Work in Chemistry*

Professor Bucher.

Three hours, or more. Through the year. Elective for Graduates.

33, 34, 35. *Conference on Special Topics in Chemistry*

Professor Bucher.

One hour. Through the year. Elective for approved students.

36, 37, 38. *Conference on Special Topics in Chemistry*

Professor Appleton.

One hour. Through the year. Elective for approved students.

VI. CIVIL ENGINEERING‡

JOHN EDWARD HILL, C.E.M., Sc.D., *Professor of Civil Engineering*
ARTHUR HORACE BLANCHARD, C.E., A.M., *Associate Professor of Civil Engineering*
HENRY BERNARDIN DROWNE, C.E., *Instructor in Civil Engineering*

1, 2, 3. *Lettering*

Practice in simple lettering as a preparation for work in the drafting room. *Professor* HILL.

One hour. Two hours of drafting. Through the year. Not elective. *1st div. Tu. 2.20 to 4.20; 2d div. Fri. 2.20 to 4.20.* Second term, *3d div. Wed. 2.20 to 4.20.*

4, 5, 6. *Surveying, elementary course*

Theory and practice of plane surveying; use of tape, compass, level, and transit; adjustment of instruments. Lectures, recitations, field work, and drafting. *Professors* HILL *and* BLANCHARD, *Mr.* DROWNE.

Three hours. One hour of recitation first and third terms, and usually six hours of field work or drafting. Through the year. Elective for students who have credit for Mathematics 3, 1, 2, and for Mechanical Drawing 1 or 2. First and Third Terms, *Tu. at 11.20; Mon., Th., 2 to 5.* Second Term, *Mon., Th., 2 to 5.*

7. *Topographical Drawing*

Pen and colored topography; contour drawing, conventional signs for structural materials. *Mr.* DROWNE.

Three hours. Six hours of drafting. Second Term. Elective for Juniors and Seniors who have credit for Mechanical Drawing 1 or 2. *Wed., Fri., 2 to 5.*

8, 9. *Surveying, advanced course*

Topography; city surveying; use of stadia, plane table, sextant, and barometer; precise base-line measurements with steel tape. Methods as in 4, 5, 6. *Professors* HILL *and* BLANCHARD, *Mr.* DROWNE.

Three hours and one hour. Second Term. Course 8 is taken during the spring recess. Elective for students who have credit for 4. *Tu. at 11.20.*

10, 11, 12, 13. *Railroad Engineering*

Theory, location, construction, and economics of railroad engineering. Lectures, recitations, field work, and drafting. Third term, railroad curves and practical problems. First term, actual location of a line about two miles long, map, and estimate of cost. Second term, railroad track and track work, ties, ballast, rails, frogs, switches, etc.; maintenance of way department; methods of work. First term, earthwork and its cost; rock excavation; tunneling; economics of location. *Professor* HILL *and Mr.* DROWNE.

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‡ All the courses in this department except 16 are required of candidates for the degree of Bachelor of Science in Civil Engineering; all except 1, 2, 3 and 32 and 35 are elective for other students.

Three, four (eight hours of field work), three, and three hours. Third, First, Second, and First Terms. Elective for students who have credit for 6 and 9. Third term, *Mon., Th., Sat., at 8.* First term, *Wed. 8 to 5.* Second term, *Tu., Wed., Sat., at 9.20.* First term, *Mon., Th., at 10.20; Sat. 9.20 to 11.20.*

14. *Hydraulic Engineering* ‡

Consideration of water supply mainly from a sanitary standpoint. A general course designed to give the chemical and biological aspects of water supply without laboratory work. Lectures, recitations, and seminary work. *Professor* HILL.

Three hours. Second Term. Elective for Juniors and Seniors. *Tu., Sat., Fri., at 10.20.*

15. *Geodesy*

Problems in geodetic surveying, with sufficient theory for a proper understanding of the formulae used. Lectures and computations. *Professor* HILL.

Three hours. One hour of recitation and five hours of computation. Third Term. Elective for students who have credit for 6 and 9, and Astronomy 5. *Th., Sat., at 10.20; Th. 1.20 to 5.20.*

16. *Municipal Improvements*

Economic and social aspects of sewerage, water works, pavements, etc. *Professor* HILL.

Three hours. First Term. Elective for Juniors and Seniors. Offered only if ten or more elect the course. *Mon., Th., Fri., at 9.20.*

17. *Hydraulic Engineering* ‡

Supplements Mechanics 2, which gives the theoretical treatment of the subject. Consideration of water supply mainly from an engineering standpoint. Irrigation, pumps, and pumping machinery; construction of dams and reservoirs. Lectures, recitations, and seminary work. *Professor* HILL.

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‡ Courses 14, 17, and 18 cover the general subject of sanitation.

Four hours. Third Term. Elective for students who have credit for Mechanics 2. *Mon., Wed., Fri., Sat., at 9.20.*

18. *Sanitary Engineering* ‡

Sewerage and house drainage; theory of sewerage, with occasional problems in design; treatment and disposal of sewage; stream pollution; appliances used in construction and maintenance; amount and velocity of flow; house drainage and its appliances; garbage collection and disposal. Lectures, recitations, and seminary work. *Professor* HILL.

Four hours. Third Term. Elective for students who have credit for Mechanics 2. *Mon., Wed., Th., Fri., at 11.20.*

19. *Highway Engineering*

Economics and location of country roads; surveys, grades, drainage, and foundations; construction and maintenance of roads of earth, gravel, and broken stone; economics and design of street pavements of asphalt, brick, bitulithic, cobble-stone, stone-block, and wood-block; methods of testing road materials; roads and pavements in foreign countries. Lectures, recitations, inspection trips, and seminary work. *Professor* BLANCHARD.

Three hours. Third Term. Elective for Sophomores, Juniors, and Seniors. *Mon., Tu., Th., at 8.*

23. *Simple Framed Structures*

The standard forms of simple roof trusses; calculation by analytical methods of stresses due to dead, snow, and wind loads; calculation by analytical methods of stresses in Pratt, Howe, Warren, and parabolic trusses due to dead, wind, uniform live, excess panel live, road roller, and locomotive wheel loads; miscellaneous trusses, skew bridges, influence lines, cranes, trussed bents, and towers. Lectures, recitations, and seminary work. *Professor* BLANCHARD.

Three hours. First Term. Elective for students who have credit for Mechanics 1. *Mon., Tu., Th., at 9.20.*

24. *Higher Framed Structures*

General analysis of continuous, movable, cantilever, and suspension bridges and three-hinged, two-hinged, and fixed-end arched ribs; calculations of stresses in continuous and non-continuous center-bearing swing bridges; theorem of three moments; deflection of framed structures; theorem of least work. Lectures, recitations, and seminary work. *Professor* Blanchard.

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‡ Courses 14, 17, and 18 cover the general subject of sanitation.

One hour. Third Term. Elective for students who have credit for 23. *Th. at 10.20.*

25. *Structural Details*

Riveted joints, roof details, tension members, combined direct and bending stresses, secondary stresses, columns under direct and eccentric loading; details of wooden structures; plate girder, pin-connected, and riveted Pratt truss railroad bridges; construction of viaducts and elevated railroads; steel mill-building and high-building construction; comparison of standard structural specifications. Lectures, recitations, and computations. *Professor* Blanchard.

Three hours. First Term. Elective for students who have credit for Mechanics 1. *Mon., Tu., Th., at 8.*

26. *Roof Design and Graphic Statics*

Graphic determination of center of gravity and moment of inertia of combinations of structural shapes; determination by graphical methods of moments in beams and stresses in simple roof trusses; determination of shears, moments, and stresses in simply supported bridge trusses by the use of influence lines; complete design, with shop drawings, of a fifty to seventy foot roof truss; revision and discussion of checked drawings; drawing and computations; inspection trips. *Mr.* Drowne.

Three hours. One hour of recitation and four hours of drafting. First Term. Elective for students who have taken Mechanical Drawing 1 or 2, and have taken or are taking 23 and 25. *Tu. 10.20 to 12.20 and 1.20 to 5.20; Wed. 2 to 5.*

27, 28. *Bridge Design*

Determination of stresses in plate girder and trussed bridges by the use of moment and shear diagrams; detail design, with shop drawings, of a plate girder highway bridge; detail design, with shop drawings, of a Pratt truss railroad bridge. Lectures on American and English shop practice; the esthetic design of bridges, design of standpipes and elevated tanks, and American methods of erection of bridges and structures. Lectures, drawing, computations, inspection trips, and seminary work. *Professor* Blanchard *and Mr.* Drowne.

Three hours. Six hours of drafting. Second and Third Terms. Elective for students who have taken 23, 25, 26. Second term, *Tu., Th., 1.20 to 4.20.* Third term, *Tu. 10.20 to 12.20 and 1.20 to 5.20.*

29. *Reinforced Concrete Structures*

Properties of reinforced concrete; theory and design of reinforced concrete arches in accordance with the elastic theory; theory and design of reinforced concrete beams, retaining walls, dams, foundations, bridges, and culverts; systems of reinforcement; methods of construction; complete design, with shop drawings, of a fifty-foot reinforced concrete highway arch bridge; complete design of a reinforced concrete retaining wall. Lectures, recitations, drafting, and computations. *Professor* BLANCHARD.

Five hours. Three hours of recitation and four hours of drafting. Second Term. Elective for students who have credit for Mechanics 1 and Mechanical Drawing 1 or 2. *Mon. 9.20; Tu., Th., 9.20 to 12.20.*

30. *Masonry Structures*

Stone masonry; static and elastic theory of the masonry arch; design of a stone arch; theory and design of masonry piers, of retaining walls, bridge abutments, and of earth and high masonry dams; complete design, with drawings, of a high masonry dam. Lectures, recitations, drafting, and computations. *Professor* BLANCHARD.

Two hours. One hour of recitation and two hours of drafting. Second Term. Elective for students who have credit for Mechanics 1 and Mechanical Drawing 1 or 2. *Mon. at 8; Mon. 10.20 to 12.20.*

31. *Foundations*

Soundings and borings, foundation-beds, deposition of concrete under water, timber foundations, coffer dams, open caissons, Cushing cylinder piers, pile formulae, driving and foundations, pneumatic caissons of wood and steel, open dredging, the Poetsch freezing process, foundations in quicksand, foundations for high buildings. Lectures, recitations, and seminary work. *Professor* BLANCHARD.

Two hours. Second Term. Elective for students who have credit for Mechanics 1. *Tu., Th., at 8.*

32. *Engineering Jurisprudence*

Essential elements of a contract, the parties to a contract, considerations, bids and bidders, work for private parties and public work. Employment of engineers, liability of the engineer as a professional man; when his functions are judicial; when he is a public officer. Real property, water rights, ownership, rights of way, boundaries, incorporeal rights, and franchises. Engineering specifications and accompanying documents. Lectures and discussion of written decisions on typical cases assigned each week. *Professor* BLANCHARD.

Two hours. Third Term. Required of candidates for the degree of Bachelor of Science. *Tu., Th., at 9.20.*

34. *Design of Sanitary Works*

Practical applications of the principles of design discussed in courses 17 and 18. Partial design of a sewerage system, water-works system, and filter plant. *Professor* HILL.

One hour. Two hours of drafting and computations. Third Term. Elective for students who have taken or are taking 17 and 18 and have credit for Mechanical Drawing 1 or 2. *Mon. 2.20 to 4.20.*

35. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Civil Engineering. The thesis must embody either a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

36. *Hydraulic Surveying*

Methods of surveying applicable to river and harbor work. Methods of measuring and rating the flow of streams. Actual measurement of the discharge of a stream by means of the current meter, weir, and floats. Recitations and field work. *Mr.* DROWNE.

Two hours. One hour of recitation and two hours of field work. Third Term. Elective for students who have credit for 4 and 6 and Mechanics 2. *Mon. at 8; Tu. 8 to 5.20.*

VII. COMPARATIVE ANATOMY

Albert Davis Mead, Ph.D., *Professor of Comparative Anatomy*
Frederic Poole Gorham, A.M., *Associate Professor of Biology*
Herbert Eugene Walter, Ph.D., *Assistant Professor of Comparative Anatomy*
Philip Henry Mitchell, Ph.D., *Instructor in Physiology*
Frank Taylor Fulton, Sc.B., M.D., *Instructor in Pathology and Histology*
Alice Wilson Wilcox, A.B., *Instructor in Household Economics and General Biology in the Women's College*
Jay Perkins, M.D., *Demonstrator in Anatomy*
John Burnham Ferguson, A.B., M.D., *Demonstrator in Anatomy*

1. *Introductory Course*

Introductory to all other courses in the department; also designed for those who, without intending to pursue the subject further, desire a general view of biological work and biological theories. Aims to give an introduction to laboratory methods of dissection and experiment and the use of the microscope, to afford a general view of the structure and functions of animals and plants, and to present an outline of the more important biological theories, such as evolution, natural selection, variation, mutation, and heredity. After the first term Comparative Anatomy 1 and Botany 1 are identical and the classes are combined. *Professor* Gorham.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. *Mon., Tu., Th., 2.20 to 4.20.*

2. *Comparative Anatomy*

Intended not only for the general student, but also for those who are particularly interested in zoology and for those who expect to study medicine. First and second terms: The structure and significance of the various organs of vertebrates with particular reference to man. Third term: A comparative survey of all animals considered in their relationship to each other and to their surroundings, including a study of some important features in the anatomy of invertebrates. Students are permitted to attend clinics and autopsies at the Rhode Island Hospital. Laboratory work, field excursions, and lectures. *Professor* Walter.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1.

3. *Bacteriology*

A general discussion of bacteria in all their relations, with special attention in the laboratory to the methods of studying bacteria, including the isolation, systematic study, and determination of unknown species. Lectures and laboratory work. *Professor* GORHAM.

Three hours. Six hours of attendance. Third Term. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon., Wed., Th., at 10.20.*

4, 5. *Advanced Histology and Pathology*

Advanced work in micro-technic and in normal and pathological histology. Adapted, to some extent, to individual requirements. *Professor* MEAD *and Dr.* FULTON.

Three hours. Six hours of attendance. First and Second Terms. Elective for Juniors, Seniors, and Graduates who have credit for 1 and 10.

7. *Chemical Physiology*

Designed both for those who are interested in physiology either from a medical or a general standpoint, and also for those who are specializing in chemistry and desire a knowledge of vital chemical processes. Includes: the chemistry of proteins, carbohydrates, and fats; the physiology of the digestive system, with the study of secretions and of artificial salivary, gastric, and pancreatic digestions; examination of blood, bile, and urine; the analysis of foods with especial reference to milk. *Dr.* MITCHELL.

Three hours. Six hours of attendance. First and Second Terms. Must be preceded by Chemistry 1, 2, 3, and should be preceded by Chemistry 10. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Tu., Fri., Sat., at 10.20.*

8. *Physical Physiology*

The physiology of muscle and nerve; the physics and physiology of the circulatory, respiratory, and alimentary systems; the causes and theories of sleep; the physiology of the special senses. *Dr.* MITCHELL.

Three hours. Six hours of attendance. Third Term. Must be preceded by 7. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Tu., Fri., Sat., at 10.20.*

33. *Clinical Analysis*

Aims to furnish practice in methods of analysis used in medical diagnosis. Analysis of urine; examination of blood and of feces; gastric analysis. *Dr.* MITCHELL.

Three hours. Six hours of attendance. Third Term. Must be preceded by 7. Elective for Juniors, Seniors, and Graduates, and for Sophomores who are not taking any other course in the department.

9. *Anatomy of the Nervous System*

A study of the architecture and composition of the brain, nerves, and sense organs in man; comparison with the nervous system of lower vertebrates; relation of nervous structure to mental activity. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1. Not to be offered in 1909–10.

10. *Embryology and Histology*

The origin and the development of the individual body, the elementary structure of the adult organs. Practice in micro-technic. Adapted to the requirements of general students and those intending to study medicine. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1.

11. *Biological Theories and Biological Problems*

Seminary course. *Professor* MEAD.

One to three hours. Through the year. Elective for Graduates.

12. *Advanced Bacteriology*

Practical work in the preparation of culture media; methods of sterilization and disinfection; qualitative and quantitative biological examination of water, milk, air, soil, and sewage; study of certain pathogenic organisms, with the determination of their pathogenic properties, and the methods of bacteriological diagnosis of disease. Laboratory work and seminary. *Professor* GORHAM.

Three to twelve hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3.

13. *Physiology, advanced course*

Laboratory work and seminary. *Dr.* MITCHELL.

Three to twelve hours. Through the year. Elective for Graduates who have sufficient knowledge of chemistry and physiology.

14. *Human Anatomy*

Laboratory instruction. A course in practical dissection. Students also have an opportunity to attend certain operations at the hospital and to be present at autopsies. *Dr.* PERKINS *and Dr.* FERGUSON.

Three hours. Through the year. Elective for Graduates.

15. *Special Advanced Work*

Research work arranged to meet the requirements of individual students. *Professor* MEAD.

Three to twelve hours. Through the year. Elective for Graduates.

[16. *Evolution*]

The history of biology, principles of classification, geographical distribution, heredity, natural selection, variation, Mendelism, and the relationship of man to the lower animals. Lectures and assigned reading. *Professor* MEAD.

Three hours. Third Term. Elective for Juniors and Seniors. Not to be offered in 1908–9. To be offered in 1909–10. *Mon., Wed., Sat., at 8.*

17. *Physiology*

A general survey of the activities of living organisms with special reference to the human body, including some applications of modern physiology to healthful living. Lectures and assigned reading. *Dr.* MITCHELL.

Three hours. Third Term. Elective for Juniors and Seniors. *Mon., Tu., Th., at 8.* Not to be offered in 1909–10.

18. *Ornithology*

A study of birds regarded as a group of living animals in relation to their environment. Lectures and field identification of wild birds during their spring migration. *Professor* WALTER.

One hour. Two hours of attendance. Third Term. Elective for Undergraduates.

19. *Entomology*

A study of insects in their scientific and economic relations. Lectures and laboratory work. *Professor* GORHAM.

One hour. Two hours of attendance. First Term. Elective for Undergraduates.

30. *Protozoology*

A consideration of the forms and activities of micro-organisms and their relation to disease. Lectures and laboratory work. *Professors* Gorham *and* Walter.

One hour. Two hours of attendance. Second Term. Elective for Undergraduates.

31. *Bacteriological Research*

Research work arranged to meet the requirements of individual students. *Professor* Gorham.

Three to twelve hours. Through the year. Elective for Graduates who have credit for 3 and 12.

32. *Zoological Seminar*

Reading and discussion of German zoological literature selected with reference to the needs of individual students. *Professor* Walter.

Three to twelve hours. Through the year. Elective for Graduates.

VIII. ECONOMICS‡

Henry Brayton Gardner, Ph.D., *Professor of Political Economy*
William Kirk, Ph.D., *Assistant Professor of Political Economy*

1. *Economics, elementary*

Affords a general outline of the subject, and serves as an introduction to the more extended and special courses which follow. *Professor* Gardner.

Three hours. Second Term. Sophomore, Junior, or Senior year. Must be preceded by Social Science 1. Required of candidates for the degree of Bachelor of Arts; elective for other students who have credit for Social Science 1. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Mon., Wed., Fri., at 12.20.*

2.* *General Economics*

The development and significance of the more important elements in the existing industrial organization; the principles governing the production, exchange, distribution, and consumption of wealth; the more important practical problems of economic life. First and third terms, *Professor* GARDNER. Second term, *Professor* KIRK.

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‡ The courses in this department other than 1 are open only to those students who have credit for Social Science 1, Economics 1, and Political Science 1, which together constitute an introduction to the advanced work of the departments of Social and Political Science and Economics.

Three hours. Through the year. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.20.*

[3. *Money and Banking*]

Principles of money and banking; recent monetary and banking history, particularly of the United States; monetary and banking systems of leading industrial nations; present monetary and banking problems. *Professor* GARDNER.

Three hours. First and Second Terms. Elective for Juniors, Seniors, and Graduates. Not offered in 1908–9. To be offered in 1909–10.

4. *Public Finance*

First term, general principles of public finance; revenues and expenditures of leading industrial nations. Second term, financial history of the United States. Third term, local finance: revenues, expenditures, and financial systems of American states and cities. *Professor* GARDNER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Not to be offered in 1909–10. *Wed., Fri., Sat., at 11.20.*

5. *History and Present Tendencies of Economics*

Early economic theories: a critical examination of the theories of the early schools of economists, especially the Physiocrats and the early English school, with particular attention to the relation between economic thought and economic life and practice. Recent economic theories: a study of the tendencies of the historical school, the Austrian school, and recent English and American writers. The growth of the principle of monopoly, its influence on the production and distribution of wealth and on the economic well-being of society. *Professors* GARDNER *and* KIRK.

Three hours. One session of an hour and a half weekly. Through the year. Elective for Seniors and Graduates who have credit for 2. Hours to be arranged with the instructor.

6. *The Labor Movement*

History and analysis of the trade-union movement; growth of collective bargaining; labor problems in the United States. *Professor* KIRK.

Three hours. First Term. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

7. *Socialism*

A brief review of the historically important socialistic schemes; mainly a study of the modern scientific socialism of Karl Marx and of the resulting socialistic movements. *Professor* KIRK.

Three hours. Second Term. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

[8. *Industrial Corporations*]

Development of the corporate form of business organization; its effects; the problems to which it gives rise. Special emphasis on the recent movements toward combination, and toward state control of corporations, particularly quasi-public corporations. *Professor* GARDNER.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. Not offered in 1908–9. To be offered in 1909–10.

9. *The Tariff*

The arguments for free trade and protection in relation to the principles of international trade; the history of tariff legislation and its effects in the United States. *Professor* KIRK.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. Not to be offered in 1909–10. *Mon., Tu., Th., at 11.20.*

10, 11, 12. *Industrial History*

First term, the chief stages in the development of the industrial life of England, with special emphasis on the origin and development of the existing form of industrial organization. Second term, the more important aspects of the industrial development of the colonies and the United States to 1860. Third term, the growth, organization, and geographical distribution of the main branches of industry since 1860; the relation of the industrial life of the United States to that of the world at large. *Professor* GARDNER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. *Tu., Th., Sat., at 12.20.*

13. *Physical and Commercial Geography*

A study of the physical features of the land; of climate, winds, ocean currents; of the geographical distribution of food-stuffs and raw materials of industry; and of the consequent development of commerce and of civilization in its economic aspects. Lectures and laboratory work. This course is the same as Geology 12. *Professors* BROWN *and* KIRK.

Three hours. Through the year. Elective for Juniors and Seniors. *Wed., Th., at 10.20; Fri. 2.20 to 4.20.*

20, 21, 22. *Investigation of Special Topics*

Intended to train the student in methods of gathering, handling, and presenting data in the study of economic life and problems. Laboratory methods. *Professors* Gardner *and* Kirk.

Three hours. Six hours of attendance. Through the year. Elective for approved Juniors, Seniors, and Graduates. Each term may be elected independently. Students desiring to elect these courses must obtain the consent of Professor Gardner or Professor Kirk before the close of the academic year 1907–8.

IX. ENGLISH ‡

Walter Cochrane Bronson,† A.M., Litt.D., *Professor of English Literature*

Lindsay Todd Damon, A.B., *Professor of Rhetoric*

Albert Knight Potter, A.M., *Associate Professor of the English Language*

George Wyllys Benedict, Ph.D., *Associate Professor of English*

Thomas Crosby, A.M., *Assistant Professor of English and Public Speaking*

Henry Barrett Huntington, A.B., *Assistant Professor of English*

Howard Bristol Grose, Jr., Ph.B., *Instructor in English*

William Thomson Hastings, A.M., *Instructor in English*

George Rupert MacMinn, A.B., *Instructor in English*

Stanley Bates Harkness, A.B., *Assistant in English*

——————————, *Assistant in English*

Harvey McLeod Kelley, A.B., *Assistant in Public Speaking*

1. *Rhetoric and Composition*

Lectures and recitations upon the fundamental laws of style, with special emphasis upon usage; prescribed reading and themes. Designed to give the student a clear and correct style and some critical standards. *Professors* Damon *and* Benedict, *Messrs.* Grose, Hastings, MacMinn, Harkness, *and* ——.

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‡ Credit for English 1 is a prerequisite for admission to all other courses in English. The requirement in English Literature for the degree of Bachelor of Arts may be satisfied by taking any one of the courses from 10 to 23 inclusive.

† On leave of absence during the academic year 1908–9.

Three hours. Through the year. Required of all Freshmen. *1st, 2d, 3d, and 4th div. Mon., Tu., Th., at 11.20; 5th, 6th, and 7th div. Mon., Wed., Fri., at 12.20; 8th div. Tu., Th., Fri., at 3.20.*

2.* *English Composition, second course*

Lectures, recitations, and prescribed reading; fortnightly themes and other written exercises. Intended to supplement the training given in 1, and to develop further the power of exact and lucid statement. *Mr.* HASTINGS.

Three hours. Through the year. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

[3.* *English Composition, advanced course*]

Frequent practice in composition and criticism. Intended to develop ease of style and clarity and vigor of thought. *Professor* DAMON.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores who have attained the grade of C in 1. With the consent of the instructor the course may be repeated. Not offered in 1908–9. To be offered in 1909–10. Alternates with 4.

4. *Argumentative Composition*

Lectures on the principles and forms of argumentative composition; frequent practice in brief-drawing and the writing of forensics and less formal arguments. Intended to develop the power of handling argumentative topics cogently and persuasively. *Professor* HUNTINGTON.

Three hours. Through the year. Elective for Juniors and Seniors. *Mon., Wed., Th., at 10.20.* Not to be offered in 1909–10. Alternates with 3.

5. *Argumentative Composition*

The principles and forms of brief-drawing and forensic writing. Lectures, written exercises, briefs, and forensics. Intended to furnish a more rapid training than 4, for students who wish to begin debate as early as possible or to go quickly over the fundamentals of argumentative composition. *Professor* HUNTINGTON.

Three hours. Two hours of attendance. First Term. Elective for Juniors and Seniors. Not elective for students who have taken 4. *Mon. at 3.20; Fri. at 2.20.*

6.* *Debate*

Intended to train students in correct and vigorous oral presentation of ideas. *Professor* HUNTINGTON, *with the coöperation of the Professors of Economics, Social and Political Science, History, and Public Speaking.*

Three hours. Second and Third Terms. Elective for a limited number of Juniors and Seniors who have credit for 5 or for one or more terms of 4. With the consent of the instructor, the course may be repeated. *Mon. 3.20 to 5.20; Fri. 2.20 to 4.20.*

7.* *Public Speaking*

Principles of voice culture; vocal interpretation of literature; extempore speaking. *Professor* CROSBY.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *1st div. Tu., Wed., Sat., at 9.20; 2d div. Wed., Fri., Sat., at 11.20.*

8. *Public Speaking, advanced course*

Practice in reading lyric, narrative, and dramatic literature, in extempore speaking, and in the composition and delivery of the common forms of the occasional address. Special attention to securing right tone-production and to improvement in speech. *Professor* CROSBY.

Three hours. Through the year. Elective for a limited number of Juniors and Seniors who have credit for 7. *Tu. at 12.20*, and a two-hour session to be arranged. Not to be offered in 1909–10.

9. *Old English*

Essentials of Anglo-Saxon grammar; prose selections; Béowulf. *Professor* POTTER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 3.20.*

10. *Chaucer*

Careful reading of most of Chaucer's works; study of Middle English grammar, with some attention to the development of Modern English. *Professor* BENEDICT.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 4.20.*

11. *English Literature from the Beginning to the Present Time*

An outline course in the history of English literature, with reading and study of the greater writers. *Professor* DAMON, *assisted by Messrs.* MACMINN *and* HARKNESS.

Three hours. Through the year. Elective for Sophomores. *Tu., Th., Sat., at 12.20.*

[12. *English Literature exclusive of the Drama, from 1400 to 1600*]

Medieval literary forms and the transition to the modern period: romance, ballad, allegory, satire, Elizabethan novels and lyrics. *Professor* BENEDICT.

Three hours. Through the year. Elective for students who have credit for 10 and one other of the courses from 9 to 23 inclusive. Not offered in 1908–9.

13. *History of the Drama in England*

The drama as a literary type and its history in England to 1642. *Professor* POTTER.

Three hours. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. Not to be offered in 1909–10. *Mon., Wed., Fri., at 12.20.*

[18. *The English Drama*]

The history of the English drama from Marlowe to the present time, with reading and study of the greater playwrights. *Mr.* GROSE.

Three hours. Through the year. Elective for Juniors and Seniors. Not offered in 1908–9.

[14. *Shakspere*]

Careful study of a few plays with special attention to exact interpretation. *Professor* POTTER.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Not offered in 1908–9.

15. *Shakspere*

Shakspere as dramatist and poet; reading of all the plays. *Professor* POTTER.

Three hours. Through the year. Elective for Juniors and Seniors. *Tu., Th., Sat., at 12.20.*

[16. *English Literature exclusive of the Drama, from 1600 to 1660*]

The decline of the Elizabethan spirit; Puritanism and Anglicanism in literature; the "metaphysical" and mystical poets; the cavalier lyrists; all the English poems and some of the prose works of Milton. *Professor* BRONSON.

Three hours. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. Not offered in 1908–9.

17. *English Literature from 1660 to 1798*

The Restoration drama; the classical school; development of the essay and the novel; the beginnings of romanticism. *Professor* HUNTINGTON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. Not to be offered in 1909–10. *Mon., Tu., Th., at 11.20.*

19. *English Literature from 1798 to 1832*

The romantic revolt in its critical and imaginative phases; influence of the French revolution; individualism in form and spirit. *Professor* BENEDICT.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Fri., Sat., at 10.20.*

20. *English Literature from 1832 to 1892*

The Victorian period; modifications of romanticism in prose and poetry; realism; the influence of science and democracy; tendencies at the end of the century. *Mr.* GROSE.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for Sophomores, Juniors, and Seniors. *Wed., Fri., Sat., at 11.20.*

[50. *The Modern Novel*]

A study of the currents of modern life and thought as expressed in some of the best novels of the nineteenth century. *Professor* DAMON.

Three hours. Third Term. Elective for Sophomores and Juniors who have taken French 50 and German 50. Not offered in 1908–9.

[22. *American Literature*]

American literature from the beginning in its relation to American life and to English literature. *Professor* BRONSON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for 11, 19, or 20. Not offered in 1908–9.

23. *Seminary in English Literature*

Subject for 1908–9: The history of literary criticism in England. *Professor* DAMON.

Three hours. Two hours of attendance. Through the year. Elective for Graduates, and for a limited number of Seniors who have attained the grade of C in two of the courses from 9 to 22 inclusive.

X. GEOLOGY ‡

CHARLES WILSON BROWN, A.M., *Assistant Professor of Geology*
——————————, *Instructor in Geology*

3. *General Geology*

A discussion of the origin, weathering, and metamorphism of rocks; of other agencies that have affected the formation and development of the earth and its crust; of certain land-forms and the stages of their development; a review of earth changes, with special reference to the development of the North American continent; the types of life characteristic of the different periods, and the principles of organic evolution they illustrate. Lectures, illustrated by models and lantern views. One-third of the first term will be devoted to laboratory work. Two field trips will be taken in the first term and three in the third term.

Three hours. Through the year. Elective for Sophomores who do not elect 1, and for Juniors and Seniors. *Tu., Fri., Sat., at 10.20.*

6. *Dynamical and Structural Geology*

An advanced course dealing with sedimentary formations old and new; with mineral veins, folds, faults, mountain-making, and other characteristics of crustal movements; and with the nature and results of igneous and metamorphic activities.

Three hours. One term. Offered if applied for. Elective for students who have credit for 3 or 16.

1. *Mineralogy*

Crystallography. The more common minerals; their recognition and determination; their occurrence in rocks; the physical properties of minerals; blowpipe analysis. Lectures and laboratory work.

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‡ Students who wish a general view of the geologic processes concerned in the development of the earth and its life should take course 3. Those who contemplate teaching physical geography should take also courses 12, 9, and 8. Students who desire to specialize in mining engineering, geology, or geography, in order to teach or to obtain appointment on government or state geological surveys, are advised to elect first the work in mineralogy and to follow it with courses 3, 11, 4, 9, 8, 6, and 12, approximately in the order given.

Three hours. Through the year. Elective for Sophomores who do not elect 3, and for Juniors and Seniors. *Tu. at 11.20; Th. 2.20 to 4.20.* Two laboratory hours to be arranged with the instructor.

4. *Petrography*

A study of the optical properties of minerals; determination of minerals and rocks by means of the petrographic microscope; a discussion of the fundamental principles of the origin and classification of rocks. Lectures and laboratory work.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have taken or are taking 1. Students intending to take this course are advised to take Physics 5 in preparation. *Wed. at 11.20.* Four laboratory hours to be arranged with the instructor.

9, 8, 11. *Field Geology*

Geological maps, their use and methods of construction; practice in the actual working out of the surface geology and stratigraphy of an assigned definite area. Field work and reports.

Three hours. Through the year. One conference hour to be arranged with the instructor and the equivalent of six hours' work in the field-area. Elective for Juniors, Seniors, and Graduates. The first term may be taken independently and is elective for students who have credit for 3 or 16; the first and second terms may be elected as a two-term course; the third term may be elected separately by students who are taking 3 or 16.

17, 16. *Engineering Geology*

Lectures; laboratory and field work. A discussion of the geologic processes and results that are closely related to engineering problems. The first term includes laboratory work upon the rock-forming minerals, typical rocks, and building stones. Two field trips in the first term and three in the third term are required, with detailed notes of the regions visited.

Two hours (four hours of attendance), three hours. First and Third Terms. Required in the Junior year for the degree of Bachelor of Science in Civil Engineering. Not elective. *Tu. 9.20 to 11.20; Fri. 10.20 to 12.20; Mon., Wed., Fri., at 10.20.*

12. *Physical and Commercial Geography*

A study of the physical features of the land; of climate, winds, ocean currents; of the geographical distribution of food-stuffs and raw materials of industry; and of the consequent development of commerce and of civilization in its economic aspects. Lectures and laboratory work. This course is the same as Economics 13. *Professors* Brown *and* Kirk.

Three hours. Through the year. Elective for Juniors and Seniors. *Wed., Th., at 10.20; Fri. 2.20 to 4.20.*

13. *Physiographic Seminary*

Discussions and reports on the more advanced problems of Physiography.

Three hours. One hour of attendance. Through the year; or, by special arrangement with the instructor, the course may be taken for a shorter period. Elective for Graduates, for Undergraduates who have passed the first term's work in course 12, and for others who have had sufficient preliminary training in Physiography.

14. *Geologic Investigation*

Research work in the field and the laboratory, arranged to meet the needs of individual students.

Through the year; or, by special arrangement with the instructor, the course may be taken for a shorter period. Elective for qualified Graduates and for from one to six hours for approved Undergraduates.

XI. GERMANIC LANGUAGES AND LITERATURES

Camillo von Klenze, Ph.D., *Professor of the Germanic Languages and Literatures*

Asa Clinton Crowell, Ph.D., *Associate Professor of the Germanic Languages and Literatures*

Johannes Benoni Eduard Jonas,† Ph.D., *Assistant Professor of the Germanic Languages and Literatures*

Robert McBurney Mitchell, A.B., *Instructor in German*

————————————, *Instructor in German*

1. *Introductory Course*

Reading, grammar, composition, conversation, dictation, sight reading. *Messrs.* Mitchell *and* ——.

Three hours. Through the year. Required of all students who did not present German for admission. *1st div. Tu., Wed., Sat., at 9.20; 2d div. Mon., Th., Fri., at 9.20; 3d div. Tu., Th., Sat., at 12.20; 4th div. Mon, Tu., Th., at 2.20.*

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† On leave of absence during the academic year 1908–9.

2. *Intermediate Course*

Reading of modern German stories (Batt and Allen's *German Stories,* volumes 1 and 2), lyrics (von Klenze or Hatfield), and one or two dramas of the classical period. Review of grammar; composition; conversation based upon the texts read. *Messrs.* MITCHELL *and* ——.

Three hours. Through the year. Required of all Freshmen who presented elementary German for admission. Not elective for students who have taken German in college. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Fri., Sat., at 10.20; 3d div. Mon., Wed., Th., at 10.20.*

3, 4, 5. *Reading Course*

Reading of modern German stories (Batt and Allen's *German Stories,* volume 2), lyrics (von Klenze or Hatfield), and two dramas illustrating respectively the classical and the modern period (Schiller's *Maria Stuart* and Hebbel's *Agnes Bernauer*). Review of grammar; composition; conversation based upon the texts read. *Professor* CROWELL *and Mr.* ——.

Three hours. Through the year. Elective for students who have credit for 1. *1st div. Mon., Wed., Th., at 10.20; 2d div. Wed., Fri., Sat., at 11.20.*

6. *Modern Prose*

Aims to train the student in reading, speaking, writing, and understanding modern German. Reading of texts selected from fiction, history, and science (Liliencron, Keller, Freytag, Helmholtz, etc.), and a text (such as Mosher's *Willkommen in Deutschland*), to introduce the student to the actual language of modern daily life. Talks in German; oral and written reports in German; letter-writing, composition, and conversation. *Professor* VON KLENZE.

Three hours. Through the year. Elective for students who have credit for 1 or 2, and for students who presented advanced German for admission. *Tu., Fri., Sat., at 10.20.*

7. *Advanced Course in Standard Authors, Classical and Modern*

One drama of Goethe's, Grillparzer's *Hero und Leander,* Hebbel's *Herodes und Mariamne,* Keller's *Romeo und Julie auf dem Dorfe,* Sudermann's *Frau Sorge.* Talks in German on the history of German literature; oral and written reports in German. *Professor* VON KLENZE.

Three hours. Through the year. Elective for students who have credit for 2, and for students who presented advanced German for admission. *Mon., Tu., Th., at 11.20.*

[23, 24, 25. *German Lyrical Poetry*]

Introduces the student to the various aspects of the inner life of the German people as reflected in the lyrical poetry of the last two centuries. Lectures in German; oral and written reports in German.

Three hours. Through the year. Elective for students who have credit for 5 or 7, or who presented advanced German for admission; also for other approved students. Each term may be elected independently. Not offered in 1908–9.

26, 27, 28. *The German Short Story*

Kleist, Ludwig, Storm, C. F. Meyer, Keller, Rosegger. A study of the origin of the short story and its development in the nineteenth century, with frequent references to its chief representatives in France, England, and America. Lectures in German; oral and written reports in German. *Mr.* MITCHELL.

Three hours. Through the year. Elective for students who have credit for 2 or 5. Each term may be elected independently. *Mon., Wed., Th., at 10.20.*

[29, 30, 31. *The German Drama of the Nineteenth Century*]

Kleist, Grillparzer, Hebbel, Hauptmann, and Sudermann. A study of the development of the German drama from waning romanticism to realism, with frequent references to the chief representatives of the modern drama in other countries.

Three hours. Through the year. Elective for students who have credit for 5, 6, or 7. Each term may be elected independently. Not offered in 1908–9.

[32. *Lessing and Schiller*]

A study of the life and representative works of each author and the problems they present. *Professor* CROWELL.

Three hours. Through the year. Elective for students who have credit for 5 or 7. Not offered in 1908–9.

10. *Goethe's Faust: Parts* 1 *and* 2

With some notice of recent dramas of kindred interest. *Professor* CROWELL.

Three hours. Through the year. Elective for students who have credit for 5 or 7. *Mon., Th., Fri., at 9.20.*

[33, 34, 35. *Goethe: A Study of His Life and Works*]

Lectures in German; reports on assigned topics; extensive reading. *Professor* VON KLENZE.

Three hours. Through the year. Elective for students who have credit for 7, 10, 12, 14, or 16. Not offered in 1908–9.

12, 13, 14. *Outline History of German Literature*

Aims to acquaint the student with the most important movements in the evolution of German literary life. Lectures in German; reports on assigned topics; extensive reading. *Professor* von Klenze.

Three hours. Through the year. Elective for students who have credit for 7, 10, 12, 14, or 16. *Tu., Th., Sat., at 12.20.*

16. *Gothic and Old High German*

The Gothic language, with reading of extracts in Streitberg's *Gotisches Elementarbuch* or Braune's *Gotische Grammatik*. Braune's *Althochdeutsche Grammatik* and *Althochdeutsches Lesebuch. Professor* Crowell.

Three hours. Through the year. Elective for Graduates. *Tu., Th., Fri., at 3.20.*

[17. *Germanic Mythology*]

Primitive Germanic religion, customs, and ideas, in their relations to German literature. Discussions based on E. Mogk's *Germanische Mythologie.*

One hour. Through the year. Elective for Juniors, Seniors, and Graduates. Not offered in 1908–9.

[20. *Old Norse*]

Holthausen's *Altisländisches Elementarbuch;* Wilken's *Prosaische Edda; Die Lieder der Edda,* edited by Sijmons and Gering. *Professor* Crowell.

Two hours. Through the year. Elective for Graduates. Students electing Old Norse should also take Germanic Mythology. Not offered in 1908–9.

[15. *Middle High German*]

The language of the Middle High German period, including an introduction to Germanic philology. Michel's *Mittelhochdeutsches Elementarbuch; Das Nibelungenlied. Professor* von Klenze.

Three hours. Through the year. Elective for students who have credit for 7, 10, 12, 14, 16, or 18. Not offered in 1908–9.

36. *Seminary in German Literature*

Aims to give training in modern methods of investigation and criticism. To be carried on in German. Subject for 1908–9: Problems affecting the sources, the evolution, and the technic of the short story of the nineteenth century. *Professor* von Klenze.

Three hours. One session weekly. Through the year. Elective for approved students.

[50. *The Classical Literature of Germany in English*]

A study of Lessing, Schiller, and Goethe, by means of English translations, in the light of the German culture of the eighteenth century, with supplementary lectures on the German drama of the nineteenth century. *Professor* VON KLENZE.

Three hours. Second Term. Elective for Sophomores and Juniors who have taken French 50. Not offered in 1908–9.

XII. GREEK LITERATURE AND HISTORY ‡

JAMES IRVING MANATT, PH.D., LL.D., *Professor of Greek Literature and History*

FRANCIS GREENLEAF ALLINSON, PH.D., *David Benedict Professor of Classical Philology*

LIDA SHAW KING, A.M., *Assistant Professor of Classical Philology*

A, B, C. *Elementary Course*

Designed to cover as much as possible of the entrance requirements in Greek, and thus to enable a student to take 1, 2, and 3 in the following year if he completes by private study before the opening of the first term the entire requirement in the *Anabasis*, and before the opening of the third term the entire requirement in Homer.

Three hours. Through the year. Elective for students who did not present elementary and advanced Greek for admission. *Tu., Th., Sat., at 12.20.*

3. *Lysias*

Selections from Lysias; selections for sight reading from Herodotus. *Professor* ALLINSON.

Three hours. First Term. Elective for students who presented elementary and advanced Greek for admission, or who have credit for Greek A, B, C and have done the additional work indicated above. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Tu., Th., Sat., at 12.20.*

1. *Plato*

Plato's *Apology* and *Crito,* with selections from the *Euthyphro* and *Phaedo. Professor* ALLINSON.

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‡ Courses 1, 2, 3 are a prerequisite for the more advanced courses in this department.

Three hours. Second Term. Elective for students who have credit for 3. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Tu., Th., Sat., at 12.20.*

2. *Homer*

The *Odyssey,* four books; rapid reading of other books; lectures on the life of the Heroic Age as revealed in the poems and illustrated by recent archeological research. *Professor* MANATT.

Three hours. Third Term. Elective for students who have credit for 1. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Tu., Th., Sat., at 12.20.*

4. *Lucian*

Selected writings. *Professor* ALLINSON.

Three hours. First Term. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

35. *Greek Historians*

Selections from Herodotus, Thucydides, and Xenophon, with a general review of Greek History. *Professor* MANATT.

Three hours. Second Term. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

6. *Dramatic Poets*

Lectures on the Greek drama. The *Prometheus* of Aeschylus; the *Oedipus Tyrannus* of Sophocles. *Professor* ALLINSON.

Three hours. Third Term. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

[7. *Plato and Aeschylus*]

Republic, book X; selections from books I-IX; *Agamemnon. Professor* ALLINSON.

Three hours. First Term. Elective for Juniors and Seniors. Not offered in 1908–9.

[8. *Homer*]

Advanced course in the *Iliad* or the *Odyssey,* intended to serve as an introduction to prehistoric archeology and as a preparation for teaching Homer. *Professor* MANATT.

Three hours. Second Term. Elective for Juniors and Seniors. Not offered in 1908–9.

[9. *Theocritus and Herondas*]

Twenty *Idylls* of Theocritus and selected *Mimes* of Herondas. *Professor* MANATT.

Three hours. Third Term. Elective for Juniors and Seniors. Not offered in 1908–9.

10. *The Drama*

The *Medea* of Euripides and the *Frogs* of Aristophanes, with rapid reading of the *Seven against Thebes* of Aeschylus for literary criticism. *Professor* ALLINSON.

Three hours. First Term. Elective for Juniors and Seniors.

11. *Herodotus*

A study of Greek History down to the beginning of the Athenian Empire. Collateral reading of Aeschylus' *Persae;* and (in translation) Plutarch's *Solon, Themistocles,* and *Aristides. Professor* MANATT.

Three hours. First Term. Elective for Juniors and Seniors.

12. *Thucydides*

The Rise and Fall of the Athenian Empire. Collateral reading of Aristophanes' *Acharnians* and *Knights;* and Plutarch's *Cimon, Pericles, and Alcibiades. Professor* MANATT.

Three hours. Second Term. Elective for Juniors and Seniors.

[13. *Lucian*]

Advanced course. *Professor* ALLINSON.

Three hours. First Term. Elective for Juniors and Seniors. Not offered in 1908–9.

[14. *Aeschines and Demosthenes*]

Speeches on the Crown; study of the Macedonian period and of Athenian political life. *Professor* MANATT.

Three hours. Second Term. Elective for Juniors and Seniors. Not offered in 1908–9.

[15. *Pindar*]

Select Odes. *Professor* MANATT.

Three hours. Third Term. Elective for Juniors and Seniors. Not offered in 1908–9.

[16, 17, 18. *Homer*]

The *Odyssey;* portions of the *Iliad* and the *Hymns* in the original; the remainder of the poems in translation. *Professor* MANATT.

Three hours. Through the year. Elective for Juniors and Seniors. Not offered in 1908–9.

19, 20. *Greek Composition*

Professor ALLINSON.

One hour. Second and Third Terms. Elective for Sophomores, Juniors, and Seniors. *Fri. at 2.20.*

21, 22. *Modern Greek*

Introduction to the language; readings from living Greek authors and Greek newspapers. *Professor* MANATT.

One hour. Second and Third Terms. Elective for Sophomores, Juniors, and Seniors.

23, 24, 25. *Greek Seminary*

Subjects for 1908–9: Menander and the Comic Fragments; Greek epigraphy, or Comparative Philology (*see* Indo-European Philology 4); Greek historical inscriptions. *Professors* MANATT (25), *and* ALLINSON (23, 24).

One two-hour session weekly. Through the year. Elective for Graduates and approved Seniors.

[26. *Attic Orators*]

Isaeus; Greek historical inscriptions. *Professor* MANATT.

Two hours. First Term. Elective for Graduates and approved Seniors. Not offered in 1908–9.

[27, 28. *Homer and Mycenaean Archeology*]

The Achillean books of the *Iliad* and the Ithacan books of the *Odyssey* studied in the light of recent archeological discoveries. *Professor* MANATT.

Two hours. First and Second Terms. Elective for Graduates and approved Seniors. Not offered in 1908–9.

[29. *Demosthenes*]

Private speeches, selected to illustrate the workings of Athenian institutions. *Professor* MANATT.

Three hours. First Term. Elective for Graduates. Not offered in 1908–9.

30, 31, 32. *Hellenistic Greek*

Characteristics of Hellenistic Greek (ἡ κοινή). The *Apologies* of Justin Martyr, or selections from the *New Testament*. This course is the same as course 10, 11, 12 offered by the department of Biblical Literature and History. First and third terms, *Professor* FOWLER. Second term, *Professor* ALLINSON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 2.20.*

33. *Greek Life*

The private and public life of the Greeks studied in the light of their history, literature, and monuments. Manual, lectures, and prescribed reading, with frequent reports, written tests, and essays. No knowledge of Greek or Latin required. The course is continued in the second and third terms as Latin 28, 29. The three terms together constitute the course in the History of Greek and Roman Life and Institutions, which alternates with Greek 34, Latin 30, and Indo-European Philology 1. *Professor* MANATT.

Three hours. First Term. Elective for Freshmen and Sophomores. *Mon., Tu., Th., at 11.20.*

[34. *Greek Literature*]

A brief history of the literature of the Greeks from Homer to Theocritus, with study of the masterpieces in the best English translations. No knowledge of Greek or Latin required. This course is continued in the second and third terms as Latin 30 and Indo-European Philology 1. The three terms together constitute the course in Greek and Roman Literature and the History of Language, which alternates with Greek 33, Latin 28, 29. *Professor* ALLINSON.

Three hours. First Term. Elective for Freshmen and Sophomores. Not offered in 1908–9.

XIII. HISTORY‡

WILLIAM MACDONALD, PH.D., LL.D., *Professor of History*
WILFRED HAROLD MUNRO, A.M., *Professor of European History*

1. *Medieval and Modern History of Europe*

A general survey of the history of western Europe from the time of the barbarian invasions to 1815. A narrative text-book supplemented by lectures, frequent written tests, and written reports and abstracts on assigned reading and topics for special investigation. *Professor* MACDONALD.

Three hours. Through the year. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy in either the Sophomore or the Junior year. *Mon., Tu., Th., at 2.20.*

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‡ The elective courses in History are regularly open only to those who have credit for 1; but, by special permission of the instructor, elective courses may be taken by Juniors who are at the same time taking 1.

2. *Spanish History*

Development of Spanish institutions, political and social; rise and greatness of Spain as a European power; its colonial system; its position with reference to the Reformation and the subsequent religious wars. *Professor* MUNRO.

Three hours. First Term. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.20.*

3. *Islam and the Crusades*

Social and political conditions in Europe and the East at the beginning of the Crusades; organization and internal condition of Islam; effect of the Crusades on the thought, life, and political development of Europe. *Professor* MUNRO.

Three hours. Second Term. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.20.*

4. *Period of the Renaissance*

Preparation for the Renaissance in the intellectual and social life of Europe; spread of the revival; connection between the Renaissance and the Reformation; artistic and literary aspects of the movement. *Professor* MUNRO.

Three hours. First Term. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

5. *Period of the Reformation*

Early movements of dissent from the Roman Church; the Protestant revolt in Germany, Switzerland, France, and England; the political and social aspects of the Reformation; the religious wars; the effect on religious belief and church organization. *Professor* MUNRO.

Three hours. Second Term. Elective for Juniors, Seniors,and Graduates. *Tu., Th., Sat., at 12.20.*

6. *The French Revolution*

Rise and progress of the Revolution in France; political and social conditions in Europe 1789–1815; permanent results of the Revolution, particularly its effect on political thought and practice. *Professor* MUNRO.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.20.*

7. *European History since 1815*

Political development of the more important states and their diplomatic relations; the revolutions of 1830 and 1848; the free-trade movement in England; the achievement of Italian unity; the founding of the German Empire; the Franco-Prussian war; the Eastern question, etc. *Professor* MUNRO.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

[8, 9, 10. *English Constitutional and Political History to 1689*]

Formation of the English constitution; establishment and growth of the church; relations with Scotland and Ireland; the Reformation; the Puritan Revolution. *Professor* MUNRO.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. Not offered in 1908–9. To be offered in 1909–10.

11, 12, 13. *English Constitutional and Political History since 1689*

Foreign relations; the development of party government and the cabinet system; the social and political changes of the nineteenth century. *Professor* MUNRO.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Tu., Th., at 2.20.*

14, 15, 16. *Seminary in European History*

Discussion of assigned subjects, reports of reading and investigation, and similar exercises. *Professor* MUNRO.

Three hours. One hour of class-room attendance. Through the year. Elective for Graduates and approved Seniors. Each term may be elected independently.

19, 20, 21. *Constitutional and Political History of the United States*

An advanced course covering the period from 1783 to the present time. Intended primarily for those who wish to specialize in American history or who expect to study law. *Professor* MACDONALD.

Three hours. Two meetings a week. Elective for Juniors, Seniors, and Graduates. *Mon., Fri., at 2.20.*

22, 23, 24. *Seminary in American History*

Designed to afford training in historical investigation and practice in the use of sources. The subjects vary from year to year, and are drawn from both the colonial and the constitutional periods. For

1908–9 the subjects are: First term, The English colonies in the early part of the eighteenth century; Second term, Biographical studies of early Revolutionary leaders; Third term, The administrations of Jefferson. *Professor* MacDonald.

Three hours. One hour of attendance. Through the year. Elective for Graduates and approved Seniors. The course presupposes an acquaintance with 27, 28, 29 or 19, 20, 21, but by special permission it may be taken by those who are taking 27, 28, 29 or 19, 20, 21.

27, 28, 29. *American History*

A general course covering the whole period from the beginnings of English colonization to the end of the Civil War. Lectures, supplemented by assigned reading, study of the texts of representative documents, and special reports. Intended as an introduction to the advanced courses in American history, and for those students who wish only a general survey of the subject or who expect to teach history. *Professor* MacDonald.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

[25.* *Principles of Historical Criticism and Research*]

The general principles of historical criticism and the literature of historical theory; Langlois and Seignobos's *Introduction to the Study of History* is used as a manual. *Professor* MacDonald.

One hour. One term. Elective for Graduates of one year's standing. Required of all candidates for the degree of Doctor of Philosophy in History. Not offered in 1908–9.

XIV. INDO-EUROPEAN PHILOLOGY

Francis Greenleaf Allinson, Ph.D., *David Benedict Professor of Classical Philology*

[1. *General Introduction to the Study of Language*]

Outline of the history of language; the Indo-European family. Adapted for students of ancient or modern languages. A continuation of Greek 34, Latin 30. The three terms together constitute the course in Greek and Roman Literature and the History of Language.

Three hours. Third Term. Elective for Freshmen and Sophomores. *Mon., Tu., Th., at 11.20.* Not offered in 1908–9.

4. *Seminary in Comparative Philology*

For advanced students in Greek and Latin.

One two-hour session weekly. Third Term. Elective for Graduates and approved Seniors.

7, 8, 9. *Sanskrit, elementary course*

Whitney's *Grammar;* Lanman's *Reader;* selections from the *Vedic Hymns.*

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

[10, 11, 12. *Sanskrit, advanced course*]

Vedic Hymns, and other selections.

One hour. Through the year. Elective for students who have credit for 7, 8, 9. Not offered in 1908–9.

XV. MATHEMATICS‡

NATHANIEL FRENCH DAVIS, A.M., LL.D., *Professor of Pure Mathematics*

HENRY PARKER MANNING, PH.D., *Associate Professor of Pure Mathematics*

FREDERICK SLOCUM,† PH.D., *Assistant Professor of Astronomy*

ROLAND GEORGE DWIGHT RICHARDSON,† PH.D., *Assistant Professor of Pure Mathematics*

CLINTON HARVEY CURRIER, A.M., *Instructor in Mathematics*

____________________, *Instructor in Mathematics*

____________________, *Instructor in Mathematics*

3. *Algebra*

Professors DAVIS *and* MANNING, *Messrs.* CURRIER, ——, *and* ——.

Four hours. First Term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Tu., Wed., Fri., Sat., one division at 8, the others at 9.20.*

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‡ The Undergraduate courses 1–11 should be taken in the order in which they are printed. Courses 12, 13, 14 may be taken at any time after the Freshman year. Courses 17–21 are designed for students who are taking or who intend to take engineering courses. Courses 22–26 are designed for Graduates: two or three of these courses are offered each year according to the needs of the students. For those who have taken all of them, other courses can usually be arranged.

† On leave of absence during the academic year 1908–9.

1. *Geometry, Solid and Spherical*

Professor MANNING, *Messrs.* CURRIER, ——, *and* ——.

Four hours. Second Term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Tu., Wed., Fri., Sat., one division at 8, the others at 9.20.*

2. *Trigonometry*

Professor DAVIS, *Messrs.* CURRIER, ——, *and* ——.

Four hours. Third Term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Tu., Wed., Fri., Sat., one division at 8, the others at 9.20.*

4. *Analytic Geometry*

Professor DAVIS.

Three hours. First and Second Terms. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. Elective for students who have credit for 1, 2, 3. *Mon., Wed., Fri., at 12.20.*

5. *Differential Calculus*

Mr. ——.

Three hours. Third Term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. Elective for students who have credit for 4. *Mon., Wed., Fri., at 12.20.*

6. *Integral Calculus*

Professor DAVIS.

Three hours. First Term. Elective for students who have credit for 5. *Tu., Th., Sat., at 12.20.*

7. *Applications of the Differential Calculus*

Professor DAVIS.

Three hours. Second Term. Elective for students who have credit for 5 and 6. *Tu., Th., Sat., at 12.20.*

8. *Applications of the Integral Calculus*

Professor MANNING.

Three hours. Third Term. Elective for students who have credit for 6. *Tu., Th., Sat., at 12.20.*

9, 10, 11. *Differential Equations*

Professor Manning.

Three hours. Through the year. Elective for students who have credit for 6 or 21. First Term required of candidates for the degree of Bachelor of Science in Electrical Engineering. *Mon., Wed., Fri., at 12.20.*

12. *Determinants and Theory of Equations*

Mr. Currier.

Three hours. Second Term. Elective for students who have credit for 3 or 16.

13. *Modern Methods of Analytic Geometry*

Professor Manning.

Three hours. Third Term. Elective for students who have credit for 4 or 19.

[14. *Solid Analytic Geometry*]

Professor Manning.

Three hours. Third Term. Elective for students who have credit for 4 or 19. Not offered in 1908–9.

15. *Spherical Trigonometry*

Professor Manning.

One hour. First Term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. Elective for students who have credit for 2 and who have not taken Spherical Trigonometry. *Mon., Th., at 9.20.*

16. *Algebra*

Professor Manning *and Mr.* Currier.

One hour, First Term. Two hours, Second and Third Terms. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. *Mon., Th., at 9.20.*

17. *Algebra*

Professor Manning, *Messrs.* Currier, ——, *and* ——.

Six hours. First Term. Required of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., one division at 12.20, the others at 11.20.*

18. *Trigonometry, Plane and Spherical*

Professors Davis *and* Manning, *Messrs.* Currier, ——, *and* ——.

Six hours. Second Term. Required of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., one division at 12.20, the others at 11.20.*

19. *Analytic Geometry*

Professors Davis *and* Manning, *Messrs.* Currier, ——, *and* ——.

Six hours. Third Term. Required of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., one division at 12.20, the others at 11.20.*

20. *Differential Calculus*

Professor Davis, *Messrs.* Currier *and* ——.

Five hours. First Term. Required of candidates for the degree of Bachelor of Science. *Tu., Wed., Th., Fri., Sat., at 8.*

21. *Integral Calculus*

Professor Davis, *Messrs.* Currier *and* ——.

Three hours. Second and Third Terms. Required of candidates for the degree of Bachelor of Science. *Tu., Wed., Fri., at 8.*

22. *Theory of Functions*

Professor Manning.

Three hours. Through the year. Elective for Graduates and approved Seniors.

23. *Differential Equations, advanced course*‡

Professor Manning.

Three hours. Through the year. Elective for Graduates who have credit for 22.

[24. *Advanced Algebra*]

Professor Manning.

Three hours. Through the year. Elective for Graduates and approved Seniors. Not offered in 1908–9.

25. *General Theory of Curves and Surfaces*‡

Professor Manning.

Three hours. Through the year. Elective for Graduates and approved Seniors.

26. *Quaternions and allied subjects*‡

Professor Manning.

Three hours. Through the year. Elective for Graduates and approved Seniors.

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‡ One of the three courses 23, 25, 26 will be offered if applied for by a sufficient number.

XVI. MECHANICAL ENGINEERING ‡

William Herbert Kenerson, M.E., A.M., *Associate Professor of Mechanical Engineering*

Thurston Mason Phetteplace, Ph.B., M.E., *Assistant Professor of Mechanical Engineering*

Robert Sylvester Curley, A.B., *Assistant in Mechanical Engineering*

Henry Dewees Cady, *Instructor in Shop Practice*

1, 2, 3. *Wood-work*

Exercises in carpentry, wood-turning, and pattern-making. *Mr.* Cady.

Three hours in any term. Seven hours of attendance. Elective for Sophomores, Juniors, and Seniors who have had instruction in drawing. *Tu. 2.20 to 5.20; Fri. 2.20 to 6.20.*

4, 5, 6. *Metal-work*

Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. *Mr.* Cady.

Three hours in any term. Seven hours of attendance. Elective for Sophomores, Juniors, and Seniors who have had instruction in drawing. *Wed. 2.20 to 5.20; Fri. 2.20 to 6.20.*

8. *Kinematics*

Velocity ratios, rolling surfaces, cams, and belting. Recitations, drawing, and the solution of problems. *Professor* Phetteplace.

Three hours. Seven hours of attendance. Third Term. Elective for students who have credit for Mechanical Drawing 5. *Tu. 12.20 to 1.20, 2.20 to 5.20; Fri. 2.20 to 5.20.*

9, 10, 11. *Kinematics*

Gearing, linkwork, parallel motions, and gear trains; machine tools; the application of the principles involved. Recitations, drawing, and the solution of problems. *Professor* Phetteplace.

Three hours. Seven hours of attendance. Through the year. Elective for students who have credit for 8 and for Mechanical Drawing 5. *Mon. 2 to 6; Th. 2.20 to 5.20.*

12, 13, 14, 15. *Machine Design*

Applications of the principles of mechanics and the strength of materials to the design of representative types of boilers, engines, and various mechanisms; solution of problems illustrating the method of designing bolts and nuts, keys, journals and bearings, fly-wheels, valve gears, etc. Lectures, calculation, and drawing. *Professor* PHETTEPLACE.

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‡ All the courses in this department are required of candidates for the degree of Bachelor of Science in Mechanical Engineering. Courses 1–6 are all elective for Sophomores, Juniors, and Seniors, but not more than two of them may be counted towards the degree of Bachelor of Arts or Bachelor of Philosophy.

Three hours. Six hours of attendance. First, Second, Third, and Third Terms. Elective for students who have credit for 8, 9, 10, 11 and Mechanics 1. *Mon., Th., 10.20 to 1.20.*

16, 17, 18. *Thermodynamics*

Applications of the principles of gases and vapors to steam, gas, and other heat engines, air-compressors, refrigerating apparatus, etc.; discussion of the energy of fuel and the utilization of such energy for power purposes by means of various media; laws of the relation of variations of pressure, temperature, and volume of such media; design of cylinders to produce a desired amount of power; the principles of the injector and the ejector. *Professor* KENERSON *and Mr.* CURLEY.

Three hours. First, Second, and Third Terms. Elective for students who have credit for Mathematics 5, 6, 7 or 20, 21. First and second terms, *Wed., Fri., Sat., at 12.20.* Third term, *Mon., Wed., Th., at 9.20.*

19, 20, 21. *Engineering Practice*

Applications of the principles of thermodynamics and mechanics to the production, transmission, utilization, and measurement of power; valves and valve gears, and valve setting; indicator practice and tests of various forms of steam engines, gas engines, etc.; standardization of auxiliary apparatus used in making the various tests; boiler testing; flue gas and fuel analysis, etc. Lectures, recitations, and laboratory work. *Professor* KENERSON *and Mr.* CURLEY.

Three hours. First, Second, and Third Terms. Elective for students who have taken or are taking 16, 17, 18. First and second terms, *Tu., Wed., Sat., at 9.20; Tu. 2.20 to 4.20.* Third term, *Mon., Th., at 8; Tu. 2.20 to 4.20.*

22. *Materials of Engineering*

Study of the sources, manufacture, and properties of the important materials used in engineering; laboratory tests to determine the behavior of materials when subjected to tensile, compressive, and torsional stresses; mixing and testing of cements and mortars; preparation and examination of sections for the microscopical study of the structure of metals and alloys. Lectures, recitations, and laboratory work. *Professor* KENERSON *and Mr.* CURLEY.

Three hours. First and Second Terms. Elective for students who have taken Mechanics 3. *Wed., Fri., at 10.20. 1st div. Mon. 2.20 to 4.20; 2d div. Tu. 2.20 to 4.20; 3d div. Th. 2.20 to 4.20; 4th div. Mon. 9.20 to 11.20.*

23. *Power Plant Engineering*

Discussion of the relation and coördination of the various parts of the complete power plant; management, and methods of determining efficiency; selection of the best equipment from manufacturers' catalogues and actual inspection. Lectures, recitations, tests, and tours of inspection. *Professors* KENERSON *and* PHETTEPLACE.

Three hours. First Term. Elective for students who have credit for 19, 20, 21. *Wed., Fri., 2.20 to 5.20.*

24. *Advanced Laboratory Course*

Investigation of special problems in hydraulic and steam engineering. Determination of experimental constants for the Venturi meter, flow of water over weirs and through pipes, flow of air, steam, etc. Particular emphasis laid on preparation and form of reports. *Professor* KENERSON.

Three hours. Second Term. *Wed., Fri., 2 to 5.*

25. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Mechanical Engineering. The thesis must embody either a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XVII. MECHANICS AND MECHANICAL DRAWING

OTIS EVERETT RANDALL, PH.D., *Professor of Mechanics and Mechanical Drawing*

ANSEL BROOKS, PH.B., M.E., *Assistant Professor of Mechanics and Mechanical Drawing*

WILLIAM ARTHUR KENNEDY, PH.B., SC.B., *Instructor in Mechanical Drawing*

MECHANICS

1. *Mechanics of Solids*

Statics, including resolution and composition of forces, determination of center of gravity, and problems relative to rigid bodies and flexible cords; dynamics, including rectilinear and curvilinear motion, virtual velocity, moment of inertia, work, energy and power, and friction; strength of materials, including tension, compression, shearing, torsion, flexure, and arches; methods of graphical solution of problems. *Professors* RANDALL *and* BROOKS.

Three hours. Through the year. Elective for students who have credit for Mathematics 4 and 5, and who have taken or are taking Mathematics 6. First and second terms required of all candidates for the degree of Bachelor of Science. *Mon., Tu., Th., at 11.20.*

3. *Strength of Materials*

Tension, compression, shearing, torsion, flexure, arches, and graphical solution of problems. *Professors* RANDALL *and* BROOKS.

Six hours. Third Term. Required of all candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., at 11.20.*

2. *Mechanics of Fluids*

Hydrostatics; nature and use of instruments; flow through orifices, over weirs, through tubes, through pipes, in conduits, flow of rivers, water supply and water power, dynamic pressure of water, water wheels, turbines, pumps and pumping. *Professor* RANDALL.

Three hours. First and Second Terms. Required of all candidates for the degree of Bachelor of Science. Elective for students who have credit for 3. *Wed., Fri., Sat., at 11.20.*

4. *Advanced Mechanics*

Higher theoretical and practical problems. *Professor* RANDALL.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 3.

MECHANICAL DRAWING

1. *Elementary Mechanical Drawing, and Descriptive Geometry*

Nature, care, and use of drafting instruments; plane problem construction; theory of orthographic projection; discussion, proof, and graphic solution of problems in descriptive geometry relating to the point, line, and plane, to line and surface generation and classification, to surface tangency, and to intersections and developments; application of the principles of descriptive geometry in isometric drawing, in shades and shadows and perspective, in machine drawing, and in practical engineering problems. *Professors* RANDALL *and* BROOKS, *Mr.* KENNEDY.

Four hours. Through the year. First term, one hour of recitation and six hours of drawing. Second and third terms, three hours of recitation and three hours of drawing. Required in the Freshman year of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., at 9.20 and 10.20.*

2. *Elementary Mechanical Drawing*

Nature, care, and use of drafting instruments; plane problem construction; theory of orthographic and isometric projection. *Professor* BROOKS *and Mr.* KENNEDY.

Three hours. Six hours of drawing. First Term. Elective for Freshmen who are candidates for the degree of Bachelor of Philosophy, and for all Sophomores, Juniors, and Seniors. *Mon., Wed., Th., at 10.20.*

3. *Descriptive Geometry*

Discussion, proof, and graphic solution of problems in descriptive geometry. *Professor* BROOKS *and Mr.* KENNEDY.

Three hours. Two hours of recitation and two hours of drawing. Second and Third Terms. Elective for Freshmen who are candidates for the degree of Bachelor of Philosophy, and for Sophomores, Juniors, and Seniors who have credit for 2. *Mon., Wed., Th., at 10.20.*

4, 5. *Machine Drawing*

Study and representation of machine parts; the principles of elementary machine design; sketches, detail and assembly drawings of machines; practice in reading drawings. *Professor* BROOKS *and Mr.* KENNEDY.

Three hours. One hour of recitation and eight hours of drawing. First and Second Terms. Required of candidates for the degree of Bachelor of Science in Mechanical Engineering or Electrical Engineering. Elective for students who have credit for 3. *Tu. at 12.20; Mon., Th., 2.20 to 5.20.*

6. *Elements of Machine Design*

Professor BROOKS *and Mr.* KENNEDY.

Three hours. One hour of recitation and five hours of drawing. Third Term. Elective for students who have credit for 5.

8. *Mechanical Drawing, practical*

For students desiring to continue their course in drawing without taking the theoretical work of descriptive geometry. Intersections and developments; third quadrant projection; sketching and dimensioning; conventional methods of representing machine parts; detailing and assembling; exercises in reading drawings; architectural drawing, including the drawing of plans and elevations, and the details of building construction. *Professor* Brooks *and Mr.* Kennedy.

Three hours. Six hours of drawing. Second and Third Terms. Elective for students who have credit for 2. *Mon., Wed., Th., at 10.20.*

XVIII. PHILOSOPHY

William Herbert Perry Faunce, A.M., D.D., LL.D., *Professor of Moral and Intellectual Philosophy*

Edmund Burke Delabarre, Ph.D., *Professor of Psychology*

Walter Goodnow Everett, Ph.D., *Professor of Philosophy and Natural Theology*

Walter Ballou Jacobs, A.M., *Professor of the Theory and Practice of Education*

Alexander Meiklejohn, Ph.D., *Professor of Logic and Metaphysics*

1. *Logic*

Aims, methods, and limitations of human thinking; a preparation for work in the sciences and in philosophy. First term, general introduction and formal logic; Second term, principles and methods of the natural sciences; Third term, relations of science to philosophy; philosophical interpretation and criticism of the results of science. *Professor* Meiklejohn.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon., Th., Fri., at 9.20.*

2. *Psychology, introductory course*

The main facts and laws of mental life, with particular attention to their arrangement in a scientific system. The course aims to provide a sound foundation for further acquaintance with this and allied subjects, for an improved judgment in dealing with many practical problems of life, and for beginning the study of philosophy. *Professor* Delabarre.

Three hours. Through the year. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

3. *Psychology, advanced course*

A seminary for the discussion of important and interesting questions in psychology. The course may be extended over several years, if desired. In the first year are usually studied the problems of mental composition, of the relation of mind and body, and of the criteria for accepting evidence for the more unusual or apparently marvelous phenomena to which the name Psychical Research is ordinarily applied. Special problems for study are arranged with individual students who desire to pursue the subject for a longer period, or who have had more than one year of previous preparation. *Professor* DELABARRE.

Three hours. Through the year. Elective for Undergraduates and Graduates who have taken course 2 or its equivalent.

4. *Experimental Psychology, introductory laboratory course*

Description of the main lines and results of experimental research; demonstrations by the instructor or the class; training in the use of apparatus and in careful scientific observation and measurement. *Professor* DELABARRE.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have taken or are taking 2. Although essentially a year course, it may, by special arrangement with the instructor, be taken for a shorter period.

5. *Experimental Psychology, advanced laboratory course*

The problems investigated vary and the course may be taken two or more years in succession. The aim is to study further the problems of experimental psychology, and, whenever possible, to make original contributions to scientific knowledge. *Professor* DELABARRE.

One to six hours. Two to twelve hours of attendance. Through the year. Elective for students who have credit for 4. May be taken for more than six hours by Graduates.

6, 7, 8. *History of Philosophy*

The successive philosophical systems in their dialectical development and mutual relations; treatment not merely analytic and historical, but synthetic and constructive as well. First term, Greek philosophy; Second term, medieval and early modern philosophy; Third term, recent and contemporary philosophy. *Professor* EVERETT.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

9, 10. *Theoretical Ethics*

Intended to aid in mastering the fundamental problems of life and character. First term, a discussion of the nature and relations of ethics and an outline of the history of the chief ethical systems. Second term, a critical study of the fundamental concepts of ethics with the aim of constructing a tenable theory of conduct. *Professor* EVERETT.

Three hours. First and Second Terms. Elective for Juniors, Seniors, and Graduates. *Tu.*, *Wed.*, *Sat.*, *at 9.20.*

11. *Practical Ethics*

The application of ethical theory to the life of the individual, the family, and the state. Discussion of current problems, personal, industrial, and social, from the ethical standpoint. *President* FAUNCE.

Three hours. Third Term. Elective for Juniors and Seniors. *Tu.*, *Wed.*, *Sat.*, *at 9.20.*

12. *Philosophy of Religion*

A study of the nature of the religious consciousness and of the ultimate problems of religious belief. *Professor* EVERETT.

Three hours. Third Term. Elective for Seniors and Graduates who have credit for one course in Philosophy. *Tu.*, *Wed.*, *Sat.*, *at 9.20.*

13, 14, 15. *Philosophical Seminary*

Lectures, written reports, and discussions on the more difficult problems of philosophy. Subject for 1908–9 to be announced later. *Professor* EVERETT.

Three hours. Through the year. Elective for Graduates.

16. *Kantian and Post-Kantian Philosophy*

Kant's *Critique of Pure Reason* studied as a source of modern philosophical theories. *Professor* MEIKLEJOHN.

Three hours. Through the year. Elective for Seniors who have credit for 6, 7, 8, and for Graduates.

17. *Metaphysics*

A seminary for the discussion of the special problems in metaphysical theory. Reading, written reports, and discussions. *Professor* MEIKLEJOHN.

Three hours. Through the year. Elective for Seniors who have credit for 6, 7, 8, and for Graduates.

EDUCATION ‡

Professor Jacobs

1. *History of Education*

Education among the early culture peoples as forming and perpetuating their civilization; the development of education in Greece and Rome as parallel to the development of thought and learning; early Christian education; the Renaissance and humanism; the rise of realism in thought and education. The history of education considered from the point of view of the history of civilization.

Three hours. First Term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

2. *Critical Study of Modern Education*

The beginnings of modern education; the naturalistic movement—Rousseau; the psychological movement—Pestalozzi, Froebel, Herbart; the scientific movement—Spencer; recent sociological tendencies; current experiments; problems which an adequate theory of education must solve.

Three hours. Second Term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

3. *Fundamental Principles of Education*

The meaning and aim of education; the function of education as a social institution; the sequence and coördination of studies; the principles of instruction; apperception; the steps in method; the use of the type in instruction; the training of the will; the principles of moral education.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

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‡ Courses 1, 2, and 3 treat education in its relation to the individual and to the social and political whole; interest in them is therefore not limited to those who intend to teach. At the same time they form an introduction to the more advanced courses in Education. Those who intend to teach are advised to elect these courses during the Junior year.

Courses 1–6 cover the usual requirements for certificates of the First Grade except where practice teaching or experience is demanded. In Rhode Island a certificate is required of all teachers in schools supported in whole or in part by public money. Certificates of the First Grade are granted without examination to those who have completed courses 1–6 and hold a college degree. Due credit is also given for separate courses.

Certificates, authorizing the holders to teach in the evening schools of the State, are issued without examination to students who have completed three years of regular work, including Education 1–3.

4. *Psychology of Education*

Theory and process of mental development, with special emphasis upon the period of adolescence; psychology of method, and of the various studies and disciplines; ways in which student and teacher may utilize a knowledge of the more fundamental activities of the mind.

Three hours. First Term. Elective for Seniors and Graduates who have credit for 1, 2, or 3, or who are taking 1. *Mon., Tu., Th., at 11.20.*

5. *Hygiene of Education*

A study of bodily growth and development; special emphasis upon the period of adolescence; play and fatigue; physical culture and athletics; arrested growth; the conditions and surroundings which favor or retard normal development; the hygiene of mind; school hygiene.

Three hours. Second Term. Elective for Seniors and Graduates who have credit for 1, 2, or 3, or who are taking 2. *Mon., Tu., Th., at 11.20.*

6. *Practical Introduction to Teaching*

The method of the recitation; management and discipline of classes; observation of good teaching; practical applications of method.

Three hours. Third Term. Elective for Seniors and Graduates who have taken or are taking other courses in Education. *Mon., Tu., Th., at 11.20.*

7, 8, 9. *Methods in Secondary School Studies and the Organization, Equipment, and Management of Secondary Schools*‡

Importance and meaning of secondary school studies; their organization into a curriculum; method as applied to each subject; the resources at the command of the teacher. The following studies receive special attention: First term, Latin and Modern Languages; Second term, History and English; Third term, Science and Mathematics.

Three hours. Two hours of class-room attendance. Through the year. Required of student-teachers. Elective for Graduates and experienced teachers. *Wed. 3.20 to 5.20.* Each term may be elected independently.

10, 11, 12. *Problems in Practical Teaching; Secondary Schools*‡

Practice teaching in the Providence High Schools under experienced teachers. Observation, reports, and conferences. Designed for those who wish to become instructors in colleges, teachers or principals in secondary schools, or superintendents of schools.

Three hours. Through the year. Elective for approved Graduates who have credit for elementary courses in Education and who are taking 7, 8, 9 and 16, 17, 18. *Fri. at 3.20*, and at other hours to be arranged.

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‡ In connection with this course, and for an explanation of the work of student-teachers, see the Catalogue.

13, 14, 15. *Problems in Practical Teaching; Grammar Grades*‡

Practice teaching in the Providence Grammar Schools under experienced teachers. Observation, reports, and conferences. Designed especially for those who wish to become grade teachers, principals of grammar schools, or superintendents of schools, but also for those who wish to teach in secondary schools. The following studies receive special attention: First term, Arithmetic; Second term, Language; Third term, History and Geography.

Three hours. Through the year. Elective for approved Graduates who have credit for elementary courses in Education and who are taking 16, 17, 18. Elective also by special permission for a limited number of Seniors. *Mon. at 3.20*, and at other hours to be arranged.

16, 17, 18. *Seminary in Education*‡

Reviews and discussions of recent publications; reports on special studies undertaken by members. The subjects vary from year to year. For 1908–9 they are: First term, Recent Educational Theory; Second term, The Making of Our Middle Schools; Third term, The Administration of Schools.

Three hours. Two hours of class-room attendance. Required of student-teachers. Elective for Graduates and experienced teachers. *Sat. 10.20 to 12.20.* Each term may be elected independently.

XIX. PHYSICS

Carl Barus, Ph.D., LL.D., *Hazard Professor of Physics*
Albert deForest Palmer, Jr., Ph.D., *Associate Professor of Physics*
Arthur Eugene Watson, Ph.D., *Assistant Professor of Physics*
Robert Franklin Field, A.M., *Assistant in Physics*

1, 2, 3. *Elementary Physics*§

First term, kinematics and dynamics; Second term, molecular physics; Third term, electricity. Lectures, illustrated by experiments and the lantern; weekly written exercises corrected in detail by the instructors. Designed for those who have had little previous training in physics. *Professor* Barus.

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‡ In connection with this course, and for an explanation of the work of student-teachers, see the Catalogue.

§ Graduates attending courses 1, 2, 3, 4, 5, 6 are held responsible for all the demonstrations, or for the full equivalent of either Watson's or Daniel's *Principles of General Physics*.

Three hours. Through the year. Elective for Undergraduates who have credit for Mathematics 1, 2, 3. *Mon., Wed., Th., at 10.20.*

4, 5, 6. *Elementary Physics, continued* ‡

First term, optics; Second term, acoustics, polarization of light; Third term, heat. Methods as in 1, 2, 3. *Professor* Barus.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1, 2, 3. *Tu., Fri., Sat., at 10.20.*

7. *Physical Measurements*

Elementary theory and practice of physical manipulation. Reports of experiments and solution of problems. *Professor* Palmer *and Mr.* Field.

Three hours. Six hours in the laboratory. Through the year. Elective for students who have credit for 1, 2, 3 or 4, 5, 6.

8, 9, 10. *Mathematical Treatment of Dynamical Problems* §

Lectures. First term, discussion of the general principles of dynamics and the development of the general equations of motion. Second and third terms, application of these principles to special problems in thermodynamics and hydrodynamics. *Professor* Palmer.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 7 and Mathematics 9.

11, 12, 13. *Mathematical Theory of Electricity and Magnetism* §

Lectures. Includes a discussion of the more important problems of electrical science. *Professor* Palmer.

Three hours. Through the year. Elective for Graduates and Seniors who have credit for 7 and Mathematics 9.

14, 15, 16. *Advanced Laboratory Course*

Special problems and reference to original sources for methods of solution. *Professors* Barus, Palmer, *and* Watson.

Three or six hours. Six or twelve hours of attendance. Through the year. Elective for students who have credit for 7.

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‡ Graduates attending courses 1, 2, 3, 4, 5, 6 are held responsible for all the demonstrations, or for the full equivalent of either Watson's or Daniel's *Principles of General Physics.*

§ Of the two courses 8, 9, 10 and 11, 12, 13, only one will be offered in any given year. In determining which shall be offered, the preference of applicants will be considered.

17, 18, 19. *Applied Harmonic Analysis and Applied Vector Analysis*‡

Importance of Fourier's method shown by examples drawn from the analytical theory of heat, from elastics, alternating electricity, and elsewhere; treatment by the aid of spherical harmonics, Bessel functions, and Lamé functions; the chief theorems of vector analysis deduced and applied to dynamics, elastics, hydrodynamics, the electromagnetics of Maxwell and Hertz, and the electronic theory of Heaviside, Lorentz, and others. *Professor* BARUS.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 1, 2, 3 and Mathematics 6, 7, 8.

20, 21, 22. *Physics, advanced course*‡

Lectures on dynamics, potential, elastics, hydrostatics, hydrodynamics, viscosity, capillarity, electrostatics, magnetism, electro-magnetism, thermo-electrics, induction, Fresnel's optics, the electromagnetic theory of light, thermal analytics, and thermodynamics. Completed in two years. *Professor* BARUS.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for Mathematics 6, 7, 8.

23. *Precision Measurements in Photometry, Electricity, Magnetism, and Electro-Chemistry*

Professor PALMER.

Three hours. Six hours in the laboratory. Through the year. Elective for students who have credit for 7 and Mathematics 6.

24. *Theory of Measurements*

Lectures on the theory and precision of measurements and on methods of taking, recording, and reducing observations; laboratory instruction in selected physical measurements. *Professor* PALMER *and Mr.* FIELD.

Three hours. One lecture and three hours in the laboratory. Through the year. Elective for students who have credit for 1, 2, 3 or 4, 5, 6 and Mathematics 6 or 21. *Mon. at 12.20.*

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‡ In determining which of the two courses 17, 18, 19 and 20, 21, 22 shall be offered in any given year, the preference of applicants will be considered.

ELECTRICAL ENGINEERING‡

Professor WATSON

1, 2, 3. *General Course*

First term, instruction in methods of generating and utilizing electric currents. Second term, technical study of the theory and working of direct current dynamo-electric machinery. Third term, laboratory practice in operating and testing various sizes and types of standard dynamos and accessory apparatus; lectures on alternating current machinery.

Three hours. Through the year. Elective for students who have taken or are taking Physics 3 and 7 and Mathematics 5 or 20. First term, *Mon.*, *Th.*, *Fri.*, *at 9.20.* Second term, *Mon.*, *Th.*, *at 9.20;* one laboratory period. Third term *Mon. at 9.20;* two laboratory periods.

4, 5, 6. *Alternating Currents*

Mathematical and graphical treatment.

Three hours. Two hours of recitation and two hours of laboratory work. Through the year. Elective for students who have credit for 3 and who have taken or are taking Mathematics 9. *Mon.*, *Th.*, *at 10.20;* one laboratory period.

7, 8, 9. *Industrial Electricity*

First term, telephone and telegraph engineering. Second term, history of electrical engineering. Third term, design and calculation of direct current machinery, including actual drawing of electrical machinery in connection with Mechanical Engineering 11.

Three hours. Through the year. Not elective. To be taken with 1, 2, 3. First term, *Tu.*, *Wed.*, *at 9.20; Sat. at 11.20.* Second and third terms, *Tu.*, *Fri.*, *at 9.20; Sat. at 11.20.*

10, 11, 12. *Special Topics in Electrical Engineering*

First term, electric railway engineering. Second term, design and calculation of alternating current machinery; central station design and equipment; systems of distribution.

Three hours. First and Second Terms. Elective for students who have credit for 1, 2, 3. First term, *Tu.*, *Wed.*, *Fri.*, *at 10.20.* Second term, *Tu.*, *Fri.*, *at 11.20* in addition.

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‡ All the courses in this department are required of candidates for the degree of Bachelor of Science in Electrical Engineering. Courses 1, 2, 3 are required of candidates for the degree of Bachelor of Science in Mechanical Engineering. Courses 1 and 2 are required of candidates for the degree of Bachelor of Science in Civil Engineering.

13. *Specific Electrical Engineering Problems*

Reading and discussion. Seminary method.

Three hours. Third Term. Not elective. *Tu., Wed., Fri., at 10.20.*

14. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Electrical Engineering. The thesis must embody either a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XX. ROMAN LITERATURE AND HISTORY

ALBERT GRANGER HARKNESS, A.M., *Professor of Roman Literature and History*

JOHN FRANCIS GREENE, A.M., *Assistant Professor of Roman Literature and History*

LIDA SHAW KING, A.M., *Assistant Professor of Classical Philology*

1. *Livy*

Designed to enable the student to acquire facility in reading Latin, and to instruct him in the use of the Latin texts as a means of gaining a knowledge of Roman history; grammatical study and literary criticism also receive attention. *Professors* HARKNESS *and* GREENE.

Three hours. First Term. Elective for students who presented elementary and advanced Latin for admission. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Sat., at 12.20.*

2. *Cicero's Letters*

Aims and methods as in 1. *Professors* HARKNESS *and* GREENE.

Three hours. Second Term. Elective for students who presented elementary and advanced Latin for admission. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Sat., at 12.20.*

3. *Tacitus's Germania and Agricola.*

Aims and methods as in 1. *Professors* HARKNESS *and* GREENE.

Three hours. Third Term. Elective for students who presented elementary and advanced Latin for admission. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Sat., at 12.20.*

4. *Horace's Odes and Epodes*

Critical study of the poems, supplemented by rapid reading with a view to comprehending the spirit of the author; the literary side of the study is made prominent. Lectures; literary topics assigned to the class for special study. *Professor* GREENE.

Three hours. First Term. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

5. *Catullus, Tibullus, and Propertius*

Aims and methods as in 4. *Professor* GREENE.

Three hours. Second Term. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

6. *Satires of Horace*

Aims and methods as in 4. *Professor* HARKNESS.

Three hours. Third Term. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

[7, 8, 9. *Latin Poetry*]

Aims to give a connected and comprehensive view of the history and development of Latin poetry. Forms with 10, 11, 12 a two-year consecutive course affording a general survey of Roman literature. Lectures on the lives and writings of the authors; reading of characteristic selections; special study by members of the class of assigned topics in literary history and criticism. First term, Plautus; Second term, Lucretius; Third term, Juvenal and Martial. *Professors* HARKNESS *and* GREENE.

Three hours. Through the year. Elective for Juniors and Seniors. Each term may be elected independently. Not offered in 1908–9.

10, 11, 12. *Latin Prose*

Aims to give a connected and comprehensive view of the history and development of Latin prose. Forms with 7, 8, 9 a two-year consecutive course affording a general survey of Roman literature. Lectures on the lives and writings of the authors, on the development of oratory, etc.; reading of characteristic selections; special study by members of the class of assigned topics in literary history and criticism. First term, specimens of early Latin, Cicero's *Brutus,* and Quintilian; Second term, Cicero; Third term, the *Annals* of Tacitus. *Professors* HARKNESS *and* GREENE.

Three hours. Through the year. Elective for Juniors and Seniors. Each term may be elected independently. Not to be offered in 1909–10. *Tu., Fri., Sat., at 10.20.*

13, 14, 15. *Petronius, Pliny the Younger, Martial*

Professor HARKNESS.

One hour. Through the year. Elective for Juniors, Seniors, and Graduates. *Fri. at 2.20.*

[16, 17, 18. *Epigraphy*]

Professor HARKNESS.

Two hours. Through the year. Elective for Graduates and approved Undergraduates. Not offered in 1908–9.

[22, 23, 24. *Latin Composition*]

Professor GREENE.

One hour. Through the year. Elective for Sophomores, Juniors, and Seniors. Not offered in 1908–9.

25, 26, 27. *Seminary in Latin*

Subject for 1908–9: Studies in paleography and in textual criticism. Reading from the poetry of the Empire. Gudeman's *Latin Literature of the Empire,* vol. I. *Professors* HARKNESS *and* GREENE.

Two hours. Through the year. Elective for Graduates.

28, 29. *Roman Life*

The private and public life of the Romans. Intended to give a comprehensive view of the civilization of Rome. Study based on the monuments and literature. Lectures, supplemented by reading and reports. No knowledge of Latin required. A continuation of Greek 33, the three terms together constituting the course called the History of Greek and Roman Life and Institutions. *Professor* GREENE.

Three hours. Second and Third Terms. Elective for Freshmen and Sophomores. Not to be offered in 1909–10.

[30. *Roman Literature*]

A brief history of Roman literature. Some of the most important and characteristic works studied in English translations. No knowledge of Latin required. Follows Greek 34 and is continued in the third term by Indo-European Philology 1. *Professor* HARKNESS.

Three hours. Second Term. Elective for Freshmen and Sophomores. Not offered in 1908–9.

[31, 32, 33. *History of the Roman Empire*]

First term, the Early Empire; Second term, the Age of the Antonines; Third term, the Age of Constantine. *Professor* GREENE.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Each term may be elected independently. Not offered in 1908–9.

XXI. ROMANCE LANGUAGES AND LITERATURES

COURTNEY LANGDON, A.B., *Professor of the Romance Languages and Literatures*

ALBERT BUSHNELL JOHNSON, A.M., *Associate Professor of the Romance Languages*

ALBERT SWIFT MORSE, A.M., *Assistant Professor of the Romance Languages*

CHARLES HERMAN HUNKINS,† A.B., *Instructor in French*

ALPHONSE MARIN LA MESLÉE, *Instructor in French*

BENJAMIN LOUIS ANTOINE HÉNIN, B. ès L., LL.B., *Assistant in French*

1. *Elementary Course*

Grammar, composition, dictation, conversation; translation of selections from modern authors into idiomatic English. *Professor* MORSE *and Mr.* LA MESLÉE.

Three hours. Through the year. Required of all students who did not present French for admission. *1st div. Tu., Th., Fri., at 8; 2d div. Tu., Wed., Sat., at 9.20; 3d div. Mon., Tu., Th., at 2.20.*

2, 3, 4. *Intermediate Course*

Reading of modern and classical authors. Review of grammar; composition and conversation based upon the texts read; dictation. *Professors* JOHNSON *and* MORSE, *Mr.* LA MESLÉE.

Three hours. Through the year. Required of all students who presented elementary French for admission. Elective for students who have credit for 1. *1st and 3d div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Fri., at 8; 4th div. Tu., Th., Fri., at 3.20; 5th div. Mon., Th., Fri., at 9.20.*

5, 6, 7. *French Language and Literature*

An introduction to classical and modern French literature; composition, conversation based on the texts read; dictation. *Mr.* LA MESLÉE.

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† On leave of absence during the academic year 1908–9.

Three hours. Through the year. Elective for students who presented advanced French for admission. *Mon., Tu., Th., at 11.20.*

[8, 9, 10. *French Literature, exclusive of the Drama, from 1800 to 1850*]

Chateaubriand, Hugo, Lamartine, De Musset, De Vigny, Balzac, George Sand, and Gautier; abstracts (in French) of works read outside the class; sight reading a prominent feature. *Professor* JOHNSON.

Three hours. Through the year. Elective for students who have credit for 2, 3, 4 or 5, 6, 7. *Mon., Tu., Th., at 11.20.* Not offered in 1908–9.

11, 12, 13. *French Literature, exclusive of the Drama, since 1850*

Flaubert, the Goncourts, Daudet, Zola, Taine, Loti, and others; abstracts (in French) of works read outside the class; sight reading a prominent feature. *Professor* JOHNSON.

Three hours. Through the year. Elective for students who have credit for 2, 3, 4 or 5, 6, 7. *Mon., Tu., Th., at 11.20.*

14. *Composition*

Practice in writing French. Most appropriately taken in connection with 5, 6, 7; 8, 9, 10; or 11, 12, 13. *Mr.* HÉNIN.

One hour. Through the year. Elective for students who have taken 2, 3, 4, or are taking 5, 6, 7. *Fri. at 2.20.*

17, 18, 19. *Old French*

The elements of Romance philology and an introduction to the literature of the Middle Ages in France. *Professor* MORSE.

Three hours. One session weekly. Through the year. Elective for approved Seniors and Graduates. *Mon., Tu., Th., at 11.20.*

[20, 21, 22. *French Literature, exclusive of the Drama, from 1600 to 1800*]

Pascal, Madame de La Fayette, La Fontaine, Boileau, Bossuet, Madame de Sévigné, Saint-Simon, Le Sage, Voltaire, Rousseau. *Professor* JOHNSON.

Three hours. Through the year. Elective for students who have credit for 10 or 13. Not offered in 1908–9.

23, 24, 25. *The French Drama*

A two-year course covering the history of the French drama. The classical school from Corneille to Beaumarchais and the romantic and realistic schools from Hugo to Rostand will be taken up in alternate years. Lectures in French. *Professor* LANGDON.

Three hours. Through the year. Elective for students who have credit for 7, 10, or 13. *Tu., Fri., Sat., at 10.20.*

[50. *Molière in English*]

A study of Molière's plays, by means of English translations, in the light of the French civilization of the seventeenth century. *Professor* LANGDON.

Three hours. First Term. Elective for Sophomores and Juniors who also elect German 50 and English 50. Not offered in 1908–9.

26, 27, 28. *Modern Italian*

Grammar, composition, conversation, and rapid translation of modern authors. *Professor* MORSE.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern foreign language. *Mon., Th., Fri., at 9.20.*

[29, 30, 31. *Italian Literature from 1321 to 1800*]

Selections from Petrarch, Sacchetti, Tasso, Macchiavelli, and Goldoni, with a brief survey of the life and history of the times. *Professor* MORSE.

Three hours. Through the year. Elective for students who have credit for 26, 27, 28. Not offered in 1908–9.

32, 33, 34. *Classical Italian*

Selections from Dante, Petrarch, Ariosto, and Tasso. *Professor* LANGDON.

Three hours. Through the year. Elective for students who have credit for 26, 27, 28.

35, 36, 37. *Dante in English*

A study of the whole of the *Divina Commedia* in English, in the light of modern thought and in connection with other great world-poems. An introduction to a study of comparative literature by means of the best available translations. *Professor* LANGDON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

38, 39, 40. *Modern Spanish*

Grammar, conversation, composition, writing from dictation, and rapid reading. *Professor* JOHNSON.

Three hours. Through the year. Elective for Juniors, and for Sophomores not electing more than one other modern foreign language. *Tu., Fri., Sat., at 10.20.*

41, 42, 43. *Spanish Language and Literature*

Selected works of classical and modern authors; composition; conversation. *Professor* JOHNSON.

Three hours. Through the year. Elective for students who have credit for 38, 39, 40. *Mon., Wed., Th., at 10.20.*

XXII. SOCIAL AND POLITICAL SCIENCE‡

GEORGE GRAFTON WILSON, PH.D., *Professor of Social and Political Science*

JAMES QUAYLE DEALEY, PH.D., *Professor of Social and Political Science*

LESTER FRANK WARD, A.M., LL.D., *Professor of Sociology*

POLITICAL SCIENCE

1. *Political Science, elementary*

Affords a general outline of the subject, and serves as an introduction to the more extended and special courses which follow. *Professor* WILSON.

Three hours. Third Term. Sophomore, Junior, or Senior year. Required of candidates for the degree of Bachelor of Arts; elective for others, who have credit for Social Science 1 and Economics 1. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Mon., Wed., Fri., at 12.20.*

8. *Constitutional Law*

The principles and development of constitutional law, with special reference to the Constitution of the United States. *Professor* DEALEY.

Three hours. First Term. Followed in the second and third terms by 2. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

2. *International Relations*

International law, diplomacy, and world-politics. *Professor* WILSON.

Three hours. Second and Third Terms. Preceded by 8. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

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‡ The courses in this department other than 1 are open only to those students who have credit for Social Science 1, Economics 1, and Political Science 1, which together constitute an introduction to the advanced work of the departments of Social and Political Science and Economics.

3, 4. *American Government*‡

First term, constitution, organization, powers, and methods of the national system of government; Second term, organization and functions of the states and cities of the United States. Followed by 5 in the third term. *Professor* DEALEY.

Three hours. First and Second Terms. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

5. *Comparative Study of Constitutions*‡

The constitutions of Germany, France, Great Britain, and Switzerland especially considered. *Professor* DEALEY.

Three hours. Third Term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

6. *Roman Law*§

The influence of Roman law on ancient and modern political institutions. *Professor* WILSON.

Three hours. One term. Offered if applied for by Graduates.

7. *Jurisprudence*§

The fundamental principles of law and legal relations. *Professor* WILSON.

Three hours. One term. Offered if applied for by Graduates.

9. *The Latin-American Republics*§

The government and social conditions of the Latin-American Republics. *Professor* DEALEY.

Three hours. One term. Offered if applied for by Graduates.

10. *Political Parties*§

The development of political parties in the United States and Europe. *Professor* WILSON.

Three hours. One term. Offered if applied for by Graduates.

11. *Administration*§

The principles and the chief national systems of administration. *Professor* WILSON.

Three hours. One term. Offered if applied for by Graduates.

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‡ Courses 3, 4, and 5 form a single course continuous through the year.

§ Courses 6, 7, 9–15 are primarily for Graduates, and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

12. *Administration (continued)*‡

Local and colonial administration. *Professor* Wilson.

Three hours. One term. Offered if applied for by Graduates.

13. *The State*‡

The origin, forms, development, functions, and institutions of the state. *Professor* Dealey.

Three hours. One term. Offered if applied for by Graduates.

14. *Development of Political Theory*‡

The growth of important political ideas traced from Plato to the present time, with emphasis on the evolution of democracy. *Professor* Dealey.

Three hours. One term. Offered if applied for by Graduates.

15. *Current Political Theory and Practice*‡

A seminary course. Intended to train students in methods of estimating the value and significance of recent publications on political topics, and the changes consequent upon current political development. *Professors* Wilson *and* Dealey.

One hour. Through the year. Elective for Graduates.

20, 21, 22. *Investigation of Special Topics*

Intended to train the student in methods of gathering, handling, and presenting data in the study of social and political problems. In connection with this course, work in comparative legislation may be taken under the direction of the Legislative Reference Bureau of the State Library. Laboratory methods. *Professors* Wilson, Dealey, *and* Kirk.

Three hours. Six hours of attendance. Through the year. Elective for Graduates and for approved Juniors and Seniors.

SOCIAL SCIENCE

1. *Social Science, elementary*

Affords a general outline of the subject, and serves as an introduction to the more extended and special courses which follow. *Professor* Dealey.

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‡ Courses 6, 7, 9–15 are primarily for Graduates, and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

Three hours. First Term. Sophomore, Junior, or Senior year. Must be followed by Economics 1 and Political Science 1. Required of candidates for the degree of Bachelor of Arts; elective for others. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Mon., Wed., Fri., at 12.20.*

2. *Social Institutions, Conditions, and Problems*

Historical development of domestic, religious, and political institutions; study of such social problems as charity, crime, intemperance, marriage and divorce, etc. *Professors* WILSON *and* DEALEY.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

3. *Origin and Development of Society*‡

The formation of human institutions and their subsequent modifications. *Professor* WARD.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

4. *Social Philosophy*‡

The relation of sociology to other sciences, especially its psychic aspects, and the interpretation of social phenomena. *Professor* WARD.

Three hours. First and Second Terms. Elective for Seniors and Graduates. *Wed., Fri., Sat., at 11.20.*

5. *Application of Sociological Principles*‡

The utility of sociology as the basis of legislation and of the social art. The improvement of society through conscious effort. *Professor* WARD.

Three hours. Third Term. Elective for Seniors and Graduates. *Wed., Fri., Sat., at 11.20.*

[6. *Sociological Aspects of Education*]§

The social importance of intellectual development and of the diffusion of knowledge. *Professor* WARD.

Three hours. Through the year. Elective for Graduates. Not offered in 1908–9.

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‡ Course 3 deals with the subject chiefly from the historical standpoint. Course 4 deals mainly with the principles and theory of sociology. Undergraduates should not elect both of these courses in the same year, and 3 should precede 4. Course 5 may properly follow either of these.

§ Courses 6–10 are primarily for Graduates, and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

10. *Significance of the Nineteenth Century and their Significance*‡

A review of modern sociological thought in Europe and America, and its influence on the life and institutions of society. *Professor* WARD.

Three hours. Through the year. Elective for Graduates. Alternates with 6.

8. *Demography*‡

Dispersion of races; social study of race characteristics; emigration, immigration, etc. *Professor* WILSON.

Three hours. One term. Offered if applied for by Graduates.

9. *Development of Social Theory*‡

Traces important theories, ancient and modern, in regard to social conditions and development. *Professor* DEALEY.

Three hours. One term. Offered if applied for by Graduates.

7. *Current Social Theory and Practice*‡

A seminary course. *Professors* WILSON *and* DEALEY

One hour. Through the year. Elective for Graduates.

PHYSICAL TRAINING

FREDERICK WILLIAM MARVEL, PH.B., *Professor of Physical Training*

From the close of the Thanksgiving recess to the end of the second term, all first and second year students are required to attend gymnasium exercises three times a week as follows:

FRESHMEN. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Mon., Tu., Th., at 4.20.*

SOPHOMORES. *1st div. Mon., Wed., Th., at 10.20; 2d div. Tu., Th., Fri., at 3.20.*

A voluntary class for Juniors and Seniors will be held on *Mon., Tu., Th., Fri., at 5.10.* Classes in heavy gymnastics, under the direction of a special instructor, are held four afternoons a week. Classes in wrestling, under the direction of a special instructor, are held two afternoons a week. Instruction in swimming, under the direction of a special instructor, is given by appointment.

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‡ Courses 6–10 are primarily for Graduates and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

MUSIC

Hamilton Crawford Macdougall, Mus.D., *Lecturer on Music*

1, 2, 3. *The Evolution of Modern Music*

A general course, taking up modern composers and their works from Haydn to Wagner and Richard Strauss. Lectures, illustrations on the piano, assigned readings, and papers. Designed to give power of appreciation and interpretation without technical detail.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. No previous knowledge of music required. *Mon.*, *Th.*, *at 11.20*, and a third hour at the pleasure of the instructor.

PRINCIPAL CHANGES IN COURSES

For 1908–9 as compared with 1907–8

Art. 7, 9, offered. 12, not offered.

Astronomy. 7, 8, 9, not offered.

Biblical Literature. 13, 17, 18, offered. 7, 8, 9; 14, 19, 20, not offered.

Botany. 2, not offered. 3, 4, 5, offered.

Chemistry. 18, 19, 20, not offered. 21, 22; 23, offered.

Civil Engineering. 20, 21, 22, omitted. 36, new.

Comparative Anatomy. 9, offered. 16, not offered. 19; 30; 31; 32; 33, new.

Economics. 3; 8, not offered. 4; 9, offered.

English. 3; 18; 16; 50; 22, not offered. 8 and 24 combined as 8, and offered. 13; 17, offered. 21, omitted.

Geology. 4, offered. 10, omitted.

German. 26, 27, 28; 10; 12, 13, 14; 16, offered. 23, 24, 25; 32; 33, 34, 35; 17; 20; 50, not offered.

Greek. 12; 10; 11; 33, offered. 7; 8; 15, not offered. 35, new. 5, omitted.

History. 8, 9, 10, not offered. 11, 12, 13, offered.

Indo-European Philology. 1, not offered.

Mathematics. 13; 22, offered. 14; 24, not offered.

Mechanical Drawing. 7, omitted.

Philosophy. 16, offered.

Physics. 24, new.

Roman Literature and History. 7, 8, 9; 22, 23, 24; 30; 31, 32, 33, not offered. 10, 11, 12; 28, 29, offered.

Romance Languages and Literatures. 8, 9, 10; 20, 21, 22; 50; 29, 30, 31, not offered. 11, 12, 13; 17, 18, 19; 32, 33, 34, offered.

Social Science. 6, not offered. 10, new.

Physical Training. Special instruction in heavy gymnastics, wrestling, and swimming, new.

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BULLETIN
OF
BROWN UNIVERSITY

ANNOUNCEMENT OF COURSES
1909-1910

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WOMEN'S COLLEGE EDITION

PROVIDENCE
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[APRIL, MAY, JUNE, OCTOBER, DECEMBER]

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ANNOUNCEMENT OF COURSES
OFFERED AT
THE WOMEN'S COLLEGE
IN
BROWN UNIVERSITY
1909-1910

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PROVIDENCE, RHODE ISLAND
PUBLISHED BY THE UNIVERSITY
1909

GENERAL ANNOUNCEMENTS
FOR
THE ACADEMIC YEAR
1909–1910

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THE Academic Year begins with chapel service in Pembroke Hall, at 9 a.m., on Wednesday, September 22.

For information regarding Entrance Examinations, Registration and Enrolment of Undergraduates and Graduates, and Requirements for the various Degrees, see pages 6 to 17 of this Announcement. The following special announcements relate to the Women's College. Undergraduates must register at the Registrar's Office, in Pembroke Hall, between 9 a.m. and 12 m., or between 2 p.m. and 4 p.m., on September 20 and 21. Undergraduates in residence must return their Registration cards to the Registrar not later than June 10. Graduate students register at the office of the Registrar of the University.

COURSES OF INSTRUCTION

A FULL description of each course, with a statement of the conditions of admission to it, may be found on pages 18–89. Courses designated by a † are given at the University, and women are admitted to them, but only on the recommendation of the Dean. Women may also be admitted to other University courses not announced here, with the special permission of the department and with the consent of the Dean. Graduate courses are open to approved Seniors. (See pages 6 to 17.)

ART

[1, 2, 3. *History of Art from Antiquity through the Renaissance*]
Not offered in 1909–10.

4, 5. *Modern Art*
Professor Poland.
Tu., Wed., Sat., at 9.25.

6. *Theory and Criticism of the Fine Arts*
Professor Poland.
Tu., Wed., Sat., at 9.25.

10. *Freehand Drawing*
Rhode Island School of Design.
Tu., or Th., or Fri., at 2.20.

11. *Practical Work in Art*
Rhode Island School of Design.
Tu., Th., Fri., at 2.20.

ASTRONOMY

1, 2, 3. *General Course*
Professor Upton.
Wed., Fri., Sat., at 11.25.

BIBLICAL LITERATURE AND HISTORY

1.† *Elementary Hebrew*

[13, 17, 18.† *Old Testament Literature and History*]
Not offered in 1909–10.

14, 19, 20.† *New Testament Literature and History*

21, 22, 23. *The English Bible as Literature*
Professor Fowler.
Tu., Wed., Sat., at 9.25.

BIOLOGY

2.† *Comparative Anatomy of Vertebrates*

3.† *Bacteriology*

4, 5.† *Advanced Histology and Pathology*

7.† *Chemical Physiology*

8.† *Physical Physiology*

9.† *Anatomy of the Nervous System*

10.† *Embryology and Histology*

16.† *Evolution*

[17.† *Physiology*]

Not offered in 1909–10.

18.† *Ornithology*

20. *Euthenics*

Aims to teach the scientific facts and physiological and economic principles upon which *right living* depends. First term: the chemistry of foods and their physiological and economic value; food constituents, proteids, carbohydrates, fats, etc.; digestion and absorption; quantitative analysis of milk; selection and preparation of food; study of dietaries. Second term: the principles of general physiology and their application to personal hygiene; circulation, respiration, excretion, and reproduction; muscular and nervous action under varying conditions of stimulation, temperature, fatigue, etc. Third term: the principles of construction and practical managment of the home necessary for the economy, health, and social efficiency of the individual occupants; demonstration of sanitary methods. Those who desire may substitute the first term's work in General Biology (22) for that of Euthenics (20). *Miss* WILCOX, *assisted by Miss* DANIELSON.

Three hours. Six hours of attendance. Through the year. Elective for all Undergraduates. *Mon. 10.25 to 12.15; Wed. 10.25 to 12.15; Th. 10.25 to 12.15.*

22. *General Biology*

Introductory to other courses in the department; also designed for those who, without intending to pursue the subjects further, desire a general view of biological work and biological theories, as variation, natural selection, evolution, and heredity. First term: practise in dissection; study of the structure and functions of the different organs of a typical mammal and comparisons with those of man. Second and third terms: use of compound microscope, study of the cell, protoplasm, tissues; metabolism, growth and reproduction in unicellular animals and plants; theories of fermentation, infection, vaccination, and immunity; more specialized forms, hydra, fern, annelid, lobster, and frog. Collecting trips in the spring. Those who desire may substitute the second and third terms of Euthenics (20) for those of General Biology (22). The classes in Botany (1) and General Biology (22) are combined the second and third terms. *Miss* Wilcox, *assisted by Miss* Danielson.

Three hours. Six hours of attendance. Through the year. Elective for undergraduates. *Tu., Wed., Sat., 9.25 to 11.15.*

BOTANY

1. *Introductory Course*
Professor Collins.
Tu., Wed., Sat., at 9.25.

2.*† *Histology and Physiology*

[3, 4, 5.† *Comparative Morphology*]
Not offered in 1909–10.

6.*† *Special Course*

7.† *Trees*

CHEMISTRY

1, 2, 3, *Descriptive Chemistry*
Professor Bucher *and Mr.* Keyes.
Tu., Th., Sat., at 12.25.

4, 5.† *Qualitative Analysis*

6.† *Quantitative Analysis*

7, 8, 9.† *Quantitative Analysis, advanced course*

10, 11, 12.† *Organic Chemistry*

18, 19, 20.† *Physical Chemistry*

[21, 22.† *Organic Chemistry, advanced course*]
Not offered in 1909–10.

[23.† *Inorganic Chemistry, advanced course*]
Not offered in 1909–10.

24, 25, 26,† *Organic Preparations, advanced course*

27, 28, 29.† *Inorganic Preparations, advanced course*

33, 34, 35. † *Conference on Special Topics in Chemistry*

36, 37, 38. † *Conference on Special Topics in Chemistry*

ECONOMICS

1. *Economics, elementary*
Dr. Kirk.
Third term. *Tu., Th., Sat., at 12.25.*

3. † *Money and Banking*

[4. † *Public Finance*]
Not offered in 1909–10.

5. † *History and Present Tendencies of Economics*

12, 6, 7. *Industrial Life, The Labor Movement, Socialism*
Dr. Kirk.
Mon., Th., Fri., at 9.25.

[9. † *The Tariff*]
Not offered in 1909–10.

10, 11, 12. † *Industrial History*

13. † *Economic and Commercial Geography*

20, 21, 22. † *Investigation of Special Topics*

ENGLISH

1. *Rhetoric and Composition*
Professor Huntington, *Messrs.* Harkness *and* L. R. Grose.
Wed., Fri., Sat., at 11.25.

3.* *English Composition, advanced course*
Mr. Hastings.
Tu., Wed., Sat., at 9.25.

[4.* *Argumentative Composition*]
Not offered in 1909–10.

[7. *Public Speaking*]
Not offered in 1909–10.

9.† *Old English*

10.† *Chaucer*

11. *English Literature from the Beginning to the Present Time*
Professor BRONSON, *assisted by Mr.* HARKNESS.
Tu., Fri., Sat., at 10.25.

[13. *History of the Drama in England*]
Not offered in 1909–10.

18. *The Modern English Drama*
Professor CROSBY.
Tu., Fri. Sat., at 10.25.

[14. *Shakspere*]
Not offered in 1909–10.

15. *Shakspere*
Professor POTTER.
Mon., Tu., Th., at 2.25.

[16. *English Literature exclusive of the Drama, from 1600 to 1660*]
Not offered in 1909–10.

[17. *English Literature from 1660 to 1798*]
Not offered in 1909–10.

[19. *English Literature from 1798 to 1832*]
Not offered in 1909–10.

20. *English Literature from 1832 to 1892*
Mr. H. B. GROSE.
Wed., Fri., Sat., at 11.25.

22. *American Literature*
Professor BRONSON.
Mon., Tu., Th., at 11.25.

GEOLOGY

3.† *General Geology*

6.† *Dynamical and Structural Geology*

12.† *Economic and Commercial Geography*

13.† *Geographic Seminary*

GERMANIC LANGUAGES AND LITERATURES

1. *Introductory Course*
Mr. MITCHELL.
Mon., Wed., Fri., at 12.25.

2. *Intermediate Course*
Professor JONAS.
Mon., Wed., Fri., at 12.25.

3, 4, 5. *Reading Course*
Professors JONAS *and* CROWELL.
Mon., Tu., Th., at 11.25.

6.† *Modern Prose*

7. *Advanced Course in Standard Authors, Classical and Modern*
Professor VON KLENZE.
Tu., Wed., Sat., at 9.25.

[29, 30, 31. *The German Drama of the Nineteenth Century*]
Not offered in 1909–10.

[32.† *Lessing and Schiller*]
Not offered in 1909–10.

10. *Goethe's Faust: Parts* 1 *and* 2
Professor CROWELL.
Mon., Wed., Fri., at 12.25.

33, 34, 35.† *Goethe: A Study of His Life and Works*

[12, 13, 14.† *Outline History of German Literature*]
Not offered in 1909–10.

17.† *Germanic Mythology*

20.† *Old Norse*

15.† *Middle High German*

GREEK LITERATURE AND HISTORY

A, B, C. *Elementary Course*
Professor MANATT *and Mr.* ——.
Mon., Wed., Fri., at 12.25.

3. *Lysias*
Professor MANATT.
Tu., Fri., Sat., at 10.25.

1. *Plato*
Professor ALLINSON.
Tu., Fri., Sat., at 10.25.

2. *Homer*
Professor MANATT.
Tu., Fri., Sat., at 10.25.

4. *Lucian*
Professor ALLINSON.
Tu., Wed., Sat., at 9.25.

35. *Greek Historians*
Professor MANATT.
Tu., Wed., Sat., at 9.25.

6. *Dramatic Poets*
Professor ALLINSON.
Tu., Wed., Sat., at 9.25.

8. *Homer*
Professor MANATT.
Mon., Tu., Th., at 11.25.

9. *Theocritus and Herondas*
Professor MANATT.
Mon., Tu., Th., at 11.25.

7. *Plato and Aeschylus*
Professor ALLINSON.
Mon., Tu., Th., at 11.25.

[10. *The Drama*]
Not offered in 1909–10.

[11. *Herodotus*]
Not offered in 1909–10.

[12. *Thucydides*]
Not offered in 1909–10.

[13. *Lucian*]
Not offered in 1909–10.

[14. *Aeschines and Demosthenes*]
Not offered in 1909–10.

[15. *Pindar*]
Not offered in 1909–10.

[16, 17, 18. *Homer*]
Not offered in 1909–10.

19, 20. *Greek Composition*
Professor ALLINSON.
Hour to be determined later.

[26. *Attic Orators*]
Not offered in 1909–10.

[27, 28. *Homer and Mycenaean Archaeology*]
Not offered in 1909–10.

[29. *Demosthenes*]
Not offered in 1909–10.

36. *Introduction to Greek Archaeology*
Outline of the remains of the earliest Greek civilization; an intro-

ductory study of Greek vases, coins, small bronzes, and terra-cotta figurines. Intended to give a general survey of these sources for Greek history and life. Illustrated lectures; collateral reading. *Professor* King.

Three hours. Third term. Elective for students who have completed one course in Latin or Greek. *Mon., Th., Fri., at 9.25.*

34. *Greek Literature*
Professor Allinson.
Mon., Wed., Th., at 10.25.

HISTORY

1. *Medieval and Modern History of Europe*
Professor MacDonald.
Mon., Tu., Th., at 11.25.

2, 3, 6. *Spanish History, Islam and the Crusades, The French Revolution*
Professor Munro.
Mon., Tu., Th., at 11.25.

[8, 9, 10. *English Constitutional and Political History to 1689*]
Not offered in 1909–10.

[11, 12, 13. *English Constitutional and Political History since 1689*]
Not offered in 1909–10.

[19, 20, 21. *Constitutional and Political History of the United States*]
Not offered in 1909–10.

22, 23, 24.† *Seminary in American History*

27, 28, 29. *American History*
Professor MacDonald.
Tu., Fri., Sat., at 10.25.

INDO-EUROPEAN PHILOLOGY

1. *General Introduction to the Study of Language*
Professor Allinson.
Mon., Wed., Th., at 10.25.

MATHEMATICS

3. *Algebra*
Professors Manning *and* Slocum.
Mon., Tu., Th., Fri., at 2.25.

1. *Solid and Spherical Geometry*
Professors Manning *and* Slocum.
Mon., Tu., Th., Fri., at 2.25.

2. *Trigonometry*
Professors Manning *and* Slocum.
Mon., Tu., Th., Fri., at 2.25.

4. *Analytic Geometry*
Professor Davis.
First and second terms. *Mon., Wed., Th., at 10.25.*

5. *Differential and Integral Calculus*
Professor Davis.
Third term. *Mon., Wed., Th., at 10.25.*

6, 7, 8.† *Differential and Integral Calculus*

9, 10, 11.† *Differential Equations*

[12.† *Determinants and Theory of Equations*]
Not offered in 1909–10.

13.† *Modern Methods of Analytic Geometry*

[14.† *Solid Analytic Geometry*]
Not offered in 1909–10.

22.† *Theory of Functions*

[23.† *Differential Equations, advanced course*]
Not offered in 1909–10.

24.† *Advanced Algebra*

[25.† *General Theory of Curves and Surfaces*]
Not offered in 1909–10.

[26.† *Quarternions and allied subjects*]
Not offered in 1909–10.

PHILOSOPHY

1. *Logic*
Professor MEIKLEJOHN, *assisted by Miss* EVERETT.
Mon., Tu., Th., at 11.25.

2. *Psychology, introductory course*
Professor DELABARRE.
Mon., Tu., Th., at 2.25.

3.† *Psychology, advanced course*

4.† *Experimental Psychology, introductory laboratory course*

5.† *Experimental Psychology, advanced laboratory course*

6, 7, 8. *History of Philosophy*
Professor EVERETT.
Mon., Wed., Th., at 10.25.

[9, 10. *Theoretical Ethics*]
Not offered in 1909–10.

11. *Practical Ethics*
President FAUNCE.
Tu., Wed., Fri., at 10.25.

[12. *Philosophy of Religion*]
Not offered in 1909–10.

[16.† *Kantian and Post-Kantian Philosophy*]
Not offered in 1909–10.

17.† *Metaphysics*

EDUCATION

Professor JACOBS

1. *History of Education*
First term. *Mon., Wed., Th., at 10.25.*

2. *Critical Study of Modern Education*
Second term. *Mon., Wed., Th., at 10.25.*

3. *Fundamental Principles of Education*
Third term. *Mon., Wed., Th., at 10.25.*

4. *Psychology of Education*
First term. *Mon., Th., Fri., at 9.25.*

5. *Hygiene of Education*
Second term. *Mon., Th., Fri., at 9.25.*

6. *Practical Introduction to Teaching*
Third term. *Mon., Wed., Th., at 9.25.*

PHYSICS

1, 2, 3. *Elementary Physics*
Professor BARUS.
Mon., Tu., Th., at 11.25.

4, 5, 6.† *Elementary Physics, continued*

7.† *Physical Measurements*

14, 15, 16.† *Advanced Laboratory Course*

17, 18, 19.† *Applied Harmonic Analysis and Applied Vector Analysis*

20, 21, 22.† *Physics, advanced course*

ROMAN LITERATURE AND HISTORY

1. *Livy*
Professor KING.
First term. *Mon., Th., Fri., at 9.25.*

2. *Cicero's Letters*
Professor GREENE.
Second term. *Mon., Th., Fri., at 9.25.*

3. *Tacitus' Germania and Agricola*
Professor GREENE.
Third term. *Mon., Th., Fri., at 9.25.*

4. *Horace's Odes and Epodes*
Professor GREENE.
First term. *Mon., Th., Fri., at 9.25.*

5. *Catullus, Tibullus, and Propertius*
Professor KING.
Second term. *Mon., Th., Fri. at 9.25.*

6. *Satires of Horace*
Professor HARKNESS.
Third term. *Mon., Th., Fri., at 9.25.*

7, 8, 9. *Latin Poetry*
Professors HARKNESS *and* GREENE.
Tu., Th., Sat., at 12.25.

[10, 11, 12. *Latin Prose*]
Not offered in 1909–10.

22, 23, 24. *Latin Composition*
Professor GREENE.
Fri. at 2.25.

[34. *Vergil*]
Bucolics, with special reference to literary sources and influence; *Georgics,* and *Aeneid,* with special reference to the history of the times. *Professor* KING.
Three hours. First term. Elective for Sophomores. Not offered in 1909–10.

30. *Roman Literature*
Professor HARKNESS.
Mon., Wed., Th., at 10.25.

ROMANCE LANGUAGES AND LITERATURES

1. *Elementary Course*
Mr. CHINARD.
Mon., Wed., Th., at 10.25.

2, 3, 4. *Intermediate Course*
Mr. HUNKINS.
Mon., Wed., Th. at 10.25.

5, 6, 7. *French Language and Literature*
Professor JOHNSON.
Tu., Wed., Sat., at 9.25.

[8, 9, 10. *French Literature, exclusive of the Drama, from 1800 to 1850*]
Not offered in 1909–10.

[11, 12, 13. *French Literature, exclusive of the Drama, since 1850*]
Not offered in 1909–10.

14. *Composition*
Mr. HÉNIN.
Tu. at 12.25.

20, 21, 22. *French Literature, exclusive of the Drama, from 1600 to 1800*
Professor JOHNSON.
Wed., Fri., Sat., at 11.25.

23, 24, 25. *The French Drama*
Professor LANGDON.
Mon., Th., Fri., at 9.25.

26, 27, 28.† *Modern Italian*

35, 36, 37. *Dante in English*
Professor LANGDON.
Wed., Fri., Sat., at 11.25.

38, 39, 40.† *Modern Spanish*

41, 42, 43.† *Spanish Language and Literature*

SOCIAL AND POLITICAL SCIENCE

POLITICAL SCIENCE

1. *Political Science, elementary*
Professor Wilson.
First term. *Tu., Th., Sat., at 12.25.*

3, 4.† *American Government*

5.† *Comparative Study of Constitutions*

SOCIAL SCIENCE

1. *Social Science, elementary*
Professor Dealey.
Second term. *Tu., Th., Sat., at 12.25.*

2. *Social Institutions, Conditions, and Problems*
Professor Dealey.
Wed., Fri., Sat., at 11.25.

3.† *Origin and Development of Society*

4.† *Social Philosophy*

5.† *Application of Sociological Principles*

MUSIC

1, 2, 3. *The Evolution of Modern Music*
Mr. Locke.
Mon., Wed., Fri., at 12.25.

PHYSICAL TRAINING

Mrs. Paine

From the close of the Thanksgiving Recess to March 11, all first and second year students are required to attend gymnasium classes three times a week, as follows:

Sophomore Division: *Mon., Tu., Th., 2.30 to 3.15.*
Freshman Division: *Mon., Tu., Th., 3.25 to 4.10.*
A voluntary class for Juniors and Seniors will be held on *Fri. at 2.30.*

ANNOUNCEMENT OF COURSES
OFFERED IN
BROWN UNIVERSITY
1909–1910

PROVIDENCE, RHODE ISLAND
PUBLISHED BY THE UNIVERSITY
1909

CALENDAR 1909–1910

Vacations and holidays occurring within the academic year 1909–10 are indicated by dark type.

1909

JULY

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AUG.

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OCT.

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NOV.

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DEC.

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1910

JAN.

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MAR.

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APR.

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MAY

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JUNE

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1910

JULY

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AUG.

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SEPT.

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OCT.

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NOV.

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DEC.

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THE UNIVERSITY CALENDAR 1909–1910

1909	
September 1.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
September 16–21.	*Thursday, Friday, Saturday, Monday, and Tuesday.* Examinations for admission to the Freshman class and to advanced standing.
September 20, 21.	*Monday and Tuesday.* Registration of new students and enrolment of students previously in residence.
September 22.	*Wednesday.* Academic Year begins (fourth Wednesday in September). Last day for registration of Graduate students.
October 2.	*Saturday.* Examination in Greek for the President's Premiums.
October 6.	*Wednesday.* Examination in Latin for the President's Premiums.
October 9.	*Saturday.* Examination in Mathematics for the Hartshorn Premiums.
October 13.	*Wednesday.* Examination in French for the President's Premiums.
October 16.	*Saturday.* Examination in German for the Cæsar Misch Premiums.
November 25.	*Thursday.* Thanksgiving Day. No University exercises.
December 14–22.	*Tuesday to Wednesday.* Term examinations.
Dec. 23, 1909 to January 4, 1910.	*Thursday to Tuesday.* Christmas Recess.
1910	
January 3, 4.	*Monday and Tuesday.* Enrolment of Undergraduate students.
January 5.	*Wednesday.* Second Term begins.

January 24.	*Monday.* Last day for receiving essays submitted in competition for the Class of 1880 Prizes.
January 25.	*Tuesday.* Preliminary discussion for the Class of 1880 Prizes.
February 1.	*Tuesday.* Last day for applications of competitors for the Carpenter Prizes in Elocution.
February 2.	*Wednesday.* Public discussion for the Class of 1880 Prizes.
February 22.	*Tuesday.* Washington's Birthday. No University exercises.
March 14–22.	*Monday to Tuesday.* Term examinations.
March 23–29.	*Wednesday to Tuesday.* Spring Recess.
March 28, 29.	*Monday and Tuesday.* Enrolment of Undergraduate students.
March 30.	*Wednesday.* Third Term begins.
April 1.	*Friday.* Last day for receiving applications for examination for the degree of Doctor of Philosophy, or of Master of Arts *in absentia.*
April 2.	*Saturday.* Last day for receiving essays submitted in competition for the Gaston Prize Medal.
April 30.	*Saturday.* Last day for receiving theses of candidates for the degree of Doctor of Philosophy. Last day for receiving applications for the Grand Army of the Republic Fellowship. Last day for receiving Commencement orations.
May 3.	*Tuesday.* Carpenter Prize Speaking Contest.
May 10.	*Tuesday.* Gaston Prize Medal Competition.
May 17.	*Tuesday.* Hicks Prize Debate.
May 30.	*Monday.* Memorial Day. No University exercises.
June 1.	*Wednesday.* Last day for examinations for advanced degrees.
June 2–10.	*Thursday to Friday.* Term examinations.

June 12.	*Sunday.* Baccalaureate Sermon, First Baptist Meeting House, 4.30 p.m.
June 13.	*Monday.* Class Day.
June 14.	*Tuesday.* Annual Meeting of the Phi Beta Kappa Society, Administration Building, 9.30 a.m. Ivy Day, Pembroke Hall. Annual Meeting of the Associated Alumni, Manning Hall, 2 p.m. Oration before the Associated Alumni, Sayles Memorial Hall, 4 p.m.
June 15.	*Wednesday.* One Hundred and Forty-Second Annual Commencement (third Wednesday in June), First Baptist Meeting House, 10 a.m.
June 16.	*Thursday.* Meeting of the Corporation.
June 16 to Sept. 27.	Summer Vacation.
September 7.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
September 21–27.	*Wednesday, Thursday, Friday, Saturday, Monday, and Tuesday.* Examinations for admission to the Freshman class and to advanced standing.
September 26, 27.	*Monday and Tuesday.* Registration of new students and enrolment of students previously in residence.
September 28.	*Wednesday.* Academic Year begins (fourth Wednesday in September).

ADMISSION TO THE UNIVERSITY

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METHODS OF ADMISSION TO THE FRESHMAN CLASS

I. ENTRANCE EXAMINATIONS CONDUCTED BY THE UNIVERSITY. Examinations for admission to the Freshman class are given by the University in September at the times and places indicated below. The University no longer offers entrance examinations in June; candidates desiring to be examined in June must take the examinations conducted under the supervision of the College Entrance Examination Board, for which see pages 7, 8. A candidate may, at his option, take all his examinations in June or in September, or he may take part in June and part in September. Before taking any examination conducted by the University, a candidate must present to the Registrar a letter of recommendation from the principal of his preparatory school and secure a card admitting him to the examination. This may be done by correspondence, provided that the written application and the recommendation are received not less than one week before the date of the first examination.

If a candidate offers subjects in excess of those required for admission, he may be examined in them at the times scheduled below and receive credit for them as college studies.

The order of the examinations in 1909 will be as follows:

THURSDAY, SEPTEMBER 16
Algebra, 27 Wilson Hall, 8 a.m. to 10 a.m.
Plane Geometry, 27 Wilson Hall, 10 a.m. to 12 m.
Elementary French, 2 Wilson Hall, 1 p.m. to 3 p.m.
Advanced French, 2 Wilson Hall, 3 p.m. to 5 p.m.

FRIDAY, SEPTEMBER 17
English A, 26 Wilson Hall, 8 a.m. to 9.30 a.m.
English B, 26 Wilson Hall, 9.30 a.m. to 11 a.m.
Elementary Latin, 25 Wilson Hall, 12 m. to 2 p.m.
Advanced Latin, 25 Wilson Hall, 2 p.m. to 3.30 p.m.
American History, 27 Wilson Hall, 3 p.m. to 5 p.m.

SATURDAY, SEPTEMBER 18
Elementary German, 2 Wilson Hall, 8 a.m. to 10 a.m.
Advanced German, 2 Wilson Hall, 10 a.m. to 12 m.
Chemistry, 2 Wilson Hall, 1 p.m. to 3 p.m.
Solid Geometry, 27 Wilson Hall, 3 p.m. to 5 p.m.
Plane Trigonometry, 27 Wilson Hall, 5 p.m. to 7 p.m.

MONDAY, SEPTEMBER 20

Astronomy, 25 Wilson Hall, 8 a.m. to 10 a.m.
Physiography, 25 Wilson Hall, 10 a.m. to 12 m.
Botany, 2 Wilson Hall, 8 a.m. to 10 a.m.
Greek and Roman History, 25 Wilson Hall, 1 p.m. to 3 p.m.
Physics, 1 Wilson Hall, 4 p.m. to 6 p.m.

TUESDAY, SEPTEMBER 21

Elementary Greek, 2 Wilson Hall, 8 a.m. to 10 a.m.
Advanced Greek, 2 Wilson Hall, 10 a.m. to 11.30 a.m.
English History, 25 Wilson Hall, 12.30 p.m. to 2.30 p.m.
Medieval and Modern History, 26 Wilson Hall, 2.30 p.m. to 4.30 p.m.

For students already pursuing courses in the University, entrance examinations are also given by the University at the close of the Christmas recess. Students desiring to take these examinations must file written applications with the Registrar before December 1. No student who has failed in an entrance examination will be granted a second examination at any time other than September, except on presentation of a tutor's certificate that he is prepared for such examination and on payment of a fee of two dollars. No entrance examinations other than those appointed above will be held unless ordered by vote of the Committee on Registration and Attendance.

II. ENTRANCE EXAMINATIONS CONDUCTED BY THE COLLEGE ENTRANCE EXAMINATION BOARD. Examinations conducted under the supervision of the College Entrance Examination Board will be accepted in place of the corresponding examinations conducted by Brown University. In 1909 these examinations will be held June 14–19.

All applications for such examinations must be addressed to the Secretary of the College Entrance Examination Board, Post Office Sub-Station 84, New York, and must be made upon a blank form to be obtained from the Secretary of the Board upon application. Applications for examination at points in the United States east of the Mississippi River, also at Minneapolis, St. Louis, and other points on the Mississippi River, must be received by the Secretary of the Board on or before Monday, May 31, 1909; applications for examination elsewhere in the United States or in Canada must be received on or before Monday, May 24, 1909; and applications for examination at points outside the United States and Canada must be received on or before Monday, May 10, 1909. Applications received later than the dates named will be accepted when it is possible to arrange for the examinations of the candidates concerned, but only upon the payment of $5.00 in addition to the regular fee.

The examination fee is $5.00 for all candidates examined at points in the United States and Canada, and $15.00 for all candidates examined at points outside of the United States and Canada. The fee (which cannot be accepted in advance of the application) should be remitted by postal order, express order, or draft on New York, to the order of the College Entrance Examination Board.

A list of the places at which examinations are to be held by the Board in June, 1909, will be published about March 1. Requests that the examinations be held at particular points, to receive proper consideration, should be transmitted to the Secretary of the Board not later than February 1.

III. ADMISSION BY CERTIFICATE. Students are admitted upon presentation of a certificate signed by the principal of any school which has the privilege of issuing certificates to Brown University.

Principals of schools in New England who desire the certificate privilege for Brown University, or for any other college represented on the New England College Entrance Certificate Board, should address the Secretary of the Board, Professor Nathaniel F. Davis, 159 Brown Street, Providence, R. I., who will furnish the necessary application blanks. These blanks must be returned to him before April 1 of the year for which the certificate privilege is desired.

The principals of schools situated outside of New England who desire the certificate privilege must make application to the Registrar of the University before May 1, and must furnish satisfactory evidence that the course of study in the school meets the requirements for admission. Blank forms for this purpose will be supplied on request. Certificates from the New York Board of Regents are accepted for the specified subjects so far as they coincide with the entrance requirements of Brown University.

Certificates are accepted for admission to the Freshman class only, not for admission to advanced standing. If any candidate offers subjects in excess of those required for admission he may be examined in them at the times indicated on pages 6, 7, and receive credit for them as college studies.

Blank forms for the certification of candidates may be obtained from the Registrar by the principals of schools having the privilege of certification. These forms should be filled out and returned to him by July 1. When a student has attended more than one school, a letter of recommendation from the principal of the school last attended must accompany the certificate.

REGISTRATION AND ENROLMENT OF UNDERGRADUATES

REGISTRATION. In September of each year all new students, whether candidates for a degree or special students, must report at the Administration Building between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first term, and fill out registration cards for the whole of the ensuing year. Failure to comply with this rule will be treated as late registration and a fee of three dollars will be charged. All new students must present at or before the time of registration all credentials necessary for admission as candidates for a degree or as special students.

In May of each year all undergraduates in residence, whether candidates for a degree or special students, must obtain at the Registrar's office registration cards for the next year; these cards must be filled out by the students with a statement of the courses elected for the whole of the ensuing year, and returned not later than June 1. Failure to comply with this rule will be treated as late registration and a fee of three dollars will be charged.

Courses bearing a single number must be elected as a whole. When term courses are grouped in one paragraph (*e. g.* Astronomy 1, 2, 3), the second term may not be taken without the first, nor the third without the second, unless specific statement to the contrary is made. In starred courses a final mark covering the work of the course as a whole will be given at the end of the course, the marks given at the end of the preceding term or terms being regarded as temporary. Changes in registration will be allowed only on presentation of sufficient reasons to the Committee on Registration and Attendance. Requests for permission to make changes in September must be presented to the committee between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first term. Requests for permission to make changes for the second or third term must be presented to the committee before the beginning of the examinations of the first and second terms respectively, unless these requests are the result of failures, in which case they must be presented in writing to the Registrar two days before the opening of the second and third terms respectively.

ENROLMENT. In September all students whose registration cards have been already approved must report at the Registrar's office between 9.30 a.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first term and have their names checked as enrolled for the term. Failure to report will be treated as late enrolment and a fee of three dollars will be charged.

At the beginning of the second and third terms all undergraduates must report at the Registrar's office between 9.30 a.m. and 5 p.m. on one of the two days preceding the opening of the term and have their names checked as enrolled for the term. Failure to report will be treated as late enrolment and a fee of three dollars will be charged.

GRADUATE STUDENTS

Graduate students must report to the Dean of the Graduate Department in No. 5 Wilson Hall between 9 a.m. and 1 p.m. or between 3 and 5 p.m. on the Monday or Tuesday preceding the opening of the first term.

GUARANTEE

Every student, with the exceptions noted below, must present at or before his registration for the first term of the year the following guarantee, properly signed and witnessed. The guarantor must be the parent or guardian, or some other responsible person.

In consideration of the admission of
as a student in Brown University, I hereby guarantee and promise to pay to said University all dues for rent, tuition, and incidental and other expenses properly chargeable to said as such student, as and when the same shall respectively become payable.

A student paying the full room charges for the year at or before his registration for the first term, and the tuition and other charges for each term at or before his registration for that term, will not be required to present a guarantee.

NOTES

When the time of recitation is not given in connection with the announcement of the courses, the hours will be arranged with the instructors at the beginning of the term.

Members of the Senior Class who are candidates for the degree of Bachelor of Science in Civil Engineering are required to give the subjects of their theses to the Professor of Civil Engineering on or before October 31, 1909.

Students desiring to rent rooms or to obtain room-mates should apply to the Registrar.

For official notices students should consult the bulletin boards in the north corridor of University Hall or in the Administration Building.

REQUIREMENTS FOR DEGREES

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ARTS

I. PRESCRIBED SUBJECTS

A*NCIENT Languages* (either Latin or Greek, or both). Six hours. At least three hours must be taken in the Freshman year, and the six hours must be completed by the end of the Sophomore year.

Modern Languages (either French or German, or both). Six hours. At least three hours must be taken in the Freshman year, and the six hours must be completed by the end of the Sophomore year.

Students presenting elementary French only must continue French in the Freshman year and take elementary German in either the Freshman or the Sophomore year. Students presenting elementary German only must continue German in the Freshman year and take elementary French in either the Freshman or the Sophomore year. Students presenting elementary French and elementary German only must continue both languages, but may postpone the continuation of one language until the Sophomore year. Students presenting elementary work in one language and elementary and advanced work in the other must take in the Freshman year the language in which the elementary work only was presented. Students presenting elementary and advanced work in both languages may take the required six hours in either French or German, or both.

Mathematics. Four or five hours. Freshman year. Four hours for students not presenting Solid Geometry and Plane Trigonometry. Five hours for students presenting Solid Geometry and Plane Trigonometry.

English. Rhetoric and Composition. Three hours. Freshman year.

European History. Three hours. Sophomore or Junior year.

English Literature. Any one of the courses in English from 10 to 23 inclusive. Sophomore, Junior, or Senior year.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Political Science, Social Science, and Economics. One three-hour, one-term course in each of the three departments. Sophomore, Junior, or Senior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year. The courses in Education cannot be taken to satisfy this requirement.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. Required Studies. *Latin* 1, 2, 3 or *Greek* 1, 2, 3. *French* 1 or 2, 3, 4 or *German* 1 or 2. *Mathematics* 3, 1, 2 or *Mathematics* 4, 5; 15, 16. *English* 1.

II. Elective Studies. One three-hour course continuous through the year must be chosen from the following list: *Latin* 1, 2, 3; for students presenting elementary and advanced Latin for admission. *Greek* A, B, C; for students not presenting Greek for admission. *Greek* 1, 2, 3; for students presenting elementary and advanced Greek for admission. *French* 1; for students not presenting French for admission. *French* 2, 3, 4; for students presenting elementary French for admission. *French* 5, 6, 7; for students presenting advanced French for admission. *German* 1; for students not presenting German for admission. *German* 2; for students presenting elementary German for admission. *German* 6, or 7, or 23, 24, 25; for students presenting advanced German for admission. *Greek* 34, *Latin* 30, *Indo-European Philology* 1 (*Greek and Roman Literature and the History of Language*); for all students. *Chemistry* 1, 2, 3;‡ for all students. *Botany* 1 or *Biology* 1; for all students. *Geology* 3; for all students.

SOPHOMORE YEAR

I. That portion of the required work in ancient and modern languages not completed in the Freshman year.

II. Other required and elective courses sufficient with those taken under I to make fifteen hours a week.

JUNIOR YEAR

I. The required History and Physical or Natural Science, if not previously taken.

II. Other required and elective courses sufficient with those taken under I to make fifteen hours a week.

SENIOR YEAR

I. All required courses not previously taken.

II. Elective courses sufficient with those taken under I to make fifteen hours a week.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF PHILOSOPHY

I. PRESCRIBED SUBJECTS

Modern Languages. An amount sufficient, with the work presented for admission, to complete the elementary course and a year of advanced work in both French and German. A student who is admitted in both advanced French and advanced German is required to continue one of these languages for one year, three hours a week.

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‡ For admission to Chemistry 4, 5, 6, see page 30.

Mathematics. Four or five hours. Freshman year. Four hours for students not presenting Solid Geometry and Plane Trigonometry. Five hours for students presenting Solid Geometry and Plane Trigonometry.

English. Rhetoric and Composition. Three hours. Freshman year.

European History. Three hours. Sophomore or Junior year.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year. The courses in Education cannot be taken to satisfy this requirement.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. Required Studies. *English* 1. *French* 1 or 2, 3, 4 or *German* 1 or 2. *Mathematics* 3, 1, 2 or *Mathematics* 4, 5; 15, 16.

II. Elective Studies. Two three-hour courses continuous through the year must be chosen from the following list: *Latin* 1, 2, 3; for students presenting elementary and advanced Latin for admission. *Greek* A, B, C; for students not presenting Greek for admission. *Greek* 1, 2, 3; for students presenting elementary and advanced Greek for admission. *French* 1; for students not presenting French for admission. *French* 2, 3, 4; for students presenting elementary French for admission. *French* 5, 6, 7; for students presenting advanced French for admission. *German* 1; for students not presenting German for admission. *German* 2; for students presenting elementary German for admission. *German* 6, or 7, or 23, 24, 25; for students presenting advanced German for admission. *Greek* 34, *Latin* 30, *Indo-European Philology* 1 (*Greek and Roman Literature and the History of Language*); for all students. *Chemistry* 1, 2, 3;‡ for all students. *Botany* 1 or *Biology* 1; for all students. *Geology* 3; for all students. *Mechanical Drawing* 2, 3; for all students.

SOPHOMORE YEAR

I. That portion of the required work in modern languages not completed in the Freshman year.

II. Other required and elective courses sufficient with those taken under I to make fifteen hours a week.

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‡For admission to Chemistry 4, 5, 6, see page 30.

JUNIOR YEAR

I. The required History and Physical or Natural Science, if not previously taken.

II. Other required and elective courses sufficient with those taken under I to make fifteen hours a week.

SENIOR YEAR

I. All required courses not previously taken.

II. Elective courses sufficient with those taken under I to make fifteen hours a week.

REQUIREMENTS
FOR THE DEGREE OF BACHELOR OF SCIENCE IN CIVIL ENGINEERING

FRESHMAN YEAR

First Term	*Second Term*	*Third Term*
Mathematics 17	Mathematics 18	Mathematics 19
Mech. Drawing 6	Mech. Drawing 6	Mech. Drawing 6
English 1	English 1	English 1

and two of the following courses, Chemistry, French, German, Spanish, *subject to the direction of the Committee on Registration and Attendance.*

SOPHOMORE YEAR

Mathematics 20	Mathematics 21	Mathematics 21
Mech. Drawing 1	Mech. Drawing 1	Mech. Drawing 1
Civil Engineering 4	Civil Engineering 5	Civil Engineering 6
Physics 1	Physics 2	Physics 3
‡Political Science 1	‡Economics 1	‡Social Science 1
	Civil Engineering 7	§Civil Engineering 8
	Civil Engineering 9	Civil Engineering 10

JUNIOR YEAR

Civil Engineering 11	Civil Engineering 12	Civil Engineering 19
Mechanics 1	Mechanics 1	Mechanics 3
Astronomy 4	Astronomy 5	
Physics 24	Physics 24	Physics 24
Elect. Engineering 1	Elect. Engineering 2	Civil Engineering 15
Geology 17	Civil Engineering 14	Geology 16

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‡ Or some other three-term course, in the Department of English, or History, or Philosophy, chosen with the approval of the head of the Department of Civil Engineering.

§ Civil Engineering 8 is taken during the spring recess.

SENIOR YEAR

First Term	*Second Term*	*Third Term*
Civil Engineering 23	Civil Engineering 31	Civil Engineering 17
Civil Engineering 25	Civil Engineering 29	Civil Engineering 18
Civil Engineering 26	Civil Engineering 27	Civil Engineering 28
Civil Engineering 35	Civil Engineering 35	Civil Engineering 24
Mech. Engineering 22	Mech. Engineering 22	Civil Engineering 36
Mechanics 2	Mechanics 2	Civil Engineering 32
Civil Engineering 13	Civil Engineering 30	Civil Engineering 34
		Botany 7

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

FRESHMAN YEAR

First Term	*Second Term*	*Third Term*
Mathematics 17	Mathematics 18	Mathematics 19
Mech. Drawing 6	Mech. Drawing 6	Mech. Drawing 6
English 1	English 1	English 1

and two of the following courses, Chemistry, French, German, Spanish, *subject to the direction of the Committee on Registration and Attendance.*

SOPHOMORE YEAR

Mathematics 20	Mathematics 21	Mathematics 21
Mech. Drawing 1	Mech. Drawing 1	Mech. Drawing 1
Mech. Drawing 4	Mech. Drawing 5	Mech. Engineering 8
Physics 1	Physics 2	Physics 3
‡Political Science 1	‡Economics 1	‡Social Science 1
	Mech. Engineering 1	Mech. Engineering 3

JUNIOR YEAR

Mechanics 1	Mechanics 1	Mechanics 3
Mech. Engineering 4	Mech. Engineering 5	
Mech. Engineering 9	Mech. Engineering 10	Mech. Engineering 11
Physics 24	Physics 24	Physics 24
Elect. Engineering 1	Elect. Engineering 2	Elect. Engineering 3
Elect. Engineering 7	Elect. Engineering 8	Elect. Engineering 9

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‡ Or some other course, not technical, chosen with the approval of the head of the Department of Electrical Engineering.

SENIOR YEAR

First Term	*Second Term*	*Third Term*
Mechanics 2	Mechanics 2	
Mathematics 9	Elect. Engineering 11	‡Physics 19
Elect. Engineering 4	Elect. Engineering 5	Elect. Engineering 6
Physics 23		Physics 23
	Elect. Engineering 12	Elect. Engineering 13
Elect. Engineering 14	Elect. Engineering 14	Elect. Engineering 14
Mech. Engineering 16	Mech. Engineering 17	Mech. Engineering 18
Mech. Engineering 22	Mech. Engineering 22	Civil Engineering 32

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

FRESHMAN YEAR

First Term	*Second Term*	*Third Term*
Mathematics 17	Mathematics 18	Mathematics 19
Mech. Drawing 6	Mech. Drawing 6	Mech. Drawing 6
English 1	English 1	English 1

and two of the following courses, Chemistry, French, German, Spanish, *subject to the direction of the Committee on Registration and Attendance.*

SOPHOMORE YEAR

Mathematics 20	Mathematics 21	Mathematics 21
Mech. Drawing 1	Mech. Drawing 1	Mech. Drawing 1
Mech. Drawing 4	Mech. Drawing 5	Mech. Engineering 8
Physics 1	Physics 2	Physics 3
§Political Science 1	§Economics 1	§Social Science 1
	Mech. Engineering 1	Mech. Engineering 2

JUNIOR YEAR

Mech. Engineering 19	Mech. Engineering 20	Mech. Engineering 21
Mech. Engineering 16	Mech. Engineering 17	Mech. Engineering 18
Mech. Engineering 3	Mech. Engineering 4	
Mech. Engineering 9	Mech. Engineering 10	Mech. Engineering 11
Mechanics 1	Mechanics 1	Mechanics 3
Physics 7	Physics 7	Physics 7

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‡ Or an equivalent.

§ Or some other course, in the Department of English, or History, or Philosophy, chosen with the approval of the head of the Department of Mechanical Engineering.

SENIOR YEAR

First Term	*Second Term*	*Third Term*
Mech. Engineering 22	Mech. Engineering 22	
Mech. Engineering 5	Mech. Engineering 6	
Mech. Engineering 12	Mech. Engineering 13	Mech. Engineering 14
Mechanics 2	Mechanics 2	Mech. Engineering 15
Elect. Engineering 1	Elect. Engineering 2	Elect. Engineering 3
Mech. Engineering 23	Mech. Engineering 24	Civil Engineering 32
Mech. Engineering 25	Mech. Engineering 25	Mech. Engineering 25

COURSES OF INSTRUCTION

IN every department the courses that bear a single number must be elected as a whole. When term courses are grouped in one paragraph (e.g. *Astronomy 1, 2, 3*), *the second term may not be taken without the first, nor the third without the second, unless specific statement to the contrary is made. In starred courses a final mark covering the work of the course as a whole is given at the end of the course, the marks given at the end of the preceding term or terms being regarded as temporary. When the time of meeting is not announced, it will be arranged by the instructor at the beginning of the term.*

I. ART ‡

WILLIAM CAREY POLAND, A.M., LITT. D., *Professor of the History of Art*

1, 2, 3. *History of Art from Antiquity through the Renaissance*

First term, ancient art; a general course in the history of ancient art, chiefly Greek. Second term, Roman, early Christian, and Medieval art; a study of Roman, Romanesque, and Gothic art, with some notice of Byzantine, Arabian, and Oriental art. Third term, art of the Renaissance; the fifteenth and sixteenth centuries; the effect on art of the dominant motives of the epoch, the development of art in the different countries of Europe, the great masters and their most significant works. Text-book, lectures, lantern views.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Wed., Th., at 10.20.*

4, 5. *Modern Art*

First term, the seventeenth and eighteenth centuries. Second term, the nineteenth century. Text-book, lectures, special assigned topics, lantern views.

Three hours. First and second terms. Elective for Juniors, Seniors, and Graduates, who have credit for 3. *Tu., Th., Sat., at 12.20.*

6. *Theory and Criticism of the Fine Arts*

A study of the more important facts and laws of artistic production. Text-book, special assigned topics, illustrated lectures.

Three hours. Third term. Elective for students who have credit for any course in Art. *Tu., Th., Sat., at 12.20.*

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‡ For a statement of the courses in Music given in connection with this department, see page 89.

[7. *Seminary in Classical Architecture*]

Critical study; reading of Vitruvius in Latin; discussion of the principles followed by the Greek and Roman architects, and of the influence of Vitruvius upon the Renaissance.

Three hours. Second and third terms. Elective for Graduates. Not offered in 1909–10.

8. *Seminary in Greek and Roman Sculpture*

An archaeological course based on Overbeck's *Schriftquellen.*

Three hours. Through the year. Elective for Graduates who read Greek and Latin. Offered if three or more elect the course. It is advised that applications be made to Professor Poland at an early date.

[9. *Seminary Study of the Acropolis of Athens*]

Critical reading, in Greek, of Pausanias' account of the Acropolis of Athens; lectures and illustrations.

Three hours. First term. Elective for Graduates who read Greek and Latin. Offered if three or more elect the course. Not offered in 1909–10.

10. *Freehand Drawing*

Training of hand and eye by progressive study of models of machine parts, casts of ornamental forms, and still-life objects.

One hour. Two hours of drawing. Through the year. Elective for all students. Given at the Rhode Island School of Design. *Tu., or Th., or Fri., at 2.20.*

11. *Practical Work in Art*

Six hours of drawing or other practical work. To illustrate the principles of delineation, color, and chiaroscuro, and the principles of design in architecture, sculpture, and painting, as exemplified in the historic forms of art.

Three hours. Through the year. Elective for students who have credit for 10, and who have taken or are taking 1, 2, 3. Given at the Rhode Island School of Design. *Tu., Th., Fri., at 2.20.*

[12. *Seminary in Renaissance Art*]

Critical study of the art of the fifteenth and sixteenth centuries, particularly Italian. A more detailed study of the spiritual conditions, the influences, and the masters, than in 3.

Three hours. Through the year. Elective for Graduates who have credit for 3. Not offered in 1909–10.

II. ASTRONOMY

WINSLOW UPTON, A.M., SC.D., *Professor of Astronomy*
FREDERICK SLOCUM, PH.D., *Assistant Professor of Astronomy*

1, 2, 3. *General Course*

Fundamental conceptions of the science; methods of professional study; present state of our knowledge of the heavenly bodies. Young's *Manual of Astronomy.* Designed either for purposes of general culture or as a preparation for technical work. *Professor* UPTON.

Three hours. Through the year. Elective for Juniors and Seniors who have credit for Mathematics 3, 1, 2. *Tu., Th., Fri., at 3.20.* Observations at Ladd Observatory.

4, 5. *Geodetic Astronomy*

Application of astronomy to geodesy; the problems of time, latitude, longitude, and azimuth. Computations and observations. *Professors* UPTON *and* SLOCUM.

Three hours. First and second terms. Required of candidates for the degree of Bachelor of Science in Civil Engineering. Elective for Juniors and Seniors who have credit for Mathematics 3, 1, 2. May be taken at the same time as 1, 2, 3. Followed in the third term by Civil Engineering 15. *Mon., Tu., Th., at 2.20.* Observations at Ladd Observatory.

7, 8, 9. *Nautical Astronomy*

Principles of navigation; methods of determining the position of a ship at sea; use of sextant, compass, and chart for determining latitude, longitude, bearings, and courses. *Professor* SLOCUM.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for Mathematics 3, 1, 2. May be taken at the same time as 1, 2, 3. Not elective for students who have taken or are taking 4, 5.

10, 11, 12. *Practical Astronomy*

Advanced study of geodetic applications of astronomy; method of least squares. Doolittle's *Practical Astronomy,* with instrumental observations. *Professor* UPTON.

Three hours. Through the year. Elective for Graduates, and for Undergraduates who have shown special aptitude for instrumental observations.

13, 14, 15. *Special Advanced Work*

Subjects selected to meet the requirements of individual students. *Professors* UPTON *and* SLOCUM.

Three hours. Through the year. Elective for Graduates and approved Undergraduates.

III. BIBLICAL LITERATURE AND HISTORY‡

Henry Thatcher Fowler, Ph.D., *Professor of Biblical Literature and History*

Henry Englander, A.M., *Lecturer on Biblical Literature and History*

LANGUAGES

1. *Elementary Hebrew*

Grammar; exercises in writing Hebrew; translation of parts of Genesis and Deuteronomy. *Professor* Fowler *and Mr.* Englander.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

2. *Historical Hebrew*

Reading of the books of Samuel and Kings with special attention to the acquisition of a vocabulary; review of the elements of Hebrew grammar and study of syntax. *Mr.* Englander.

Three hours. Through the year. Elective for students who have credit for 1.

3. *Hebrew Literature*

Prophetic literature. Critical translation of the prophetic books of the Old Testament and study of the development of Israel's prophecy. In succeeding years corresponding courses in the Psalm, Wisdom, and Legal literature of the Old Testament will be offered. *Professor* Fowler *and Mr.* Englander.

Three hours. Through the year. Elective for Graduates and approved Undergraduates.

4. *Textual Criticism of the Old Testament*

The principles and method of textual criticism, in connection with the study of one of the shorter prophetical books. *Mr.* Englander.

Three hours. One term. Offered if applied for by Graduates.

5. *Biblical Aramaic*

Grammar and reading of the Aramaic portions of the Old Testament. *Mr.* Englander.

Three hours. One term. Offered if applied for by students who have credit for 1.

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‡ For conditions under which students may receive credit in the Newton Theological Institution for work done in this department, see the Catalogue, page 159.

6. *Elementary Arabic*

Grammar; exercises in writing Arabic; translation of prose selections. *Professor* Fowler.

Two hours. Through the year. Elective for Seniors and Graduates.

7, 8, 9. *Gospels and Epistles*

Characteristics of Hellenistic Greek; translation, and investigation of date, authorship, and thought. First term, the Johannine writings. Second term, the Gospel of Mark and the First Epistle of Peter. Third term, the Gospels of Matthew and Luke. If desired by the class, translation from the writings of Justin Martyr may be substituted for the specified reading of the third term. First and second terms, *Professor* Fowler. Third term, *Professor* Allinson.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently.

[10, 11, 12. *Acts and Pauline Epistles*]

First term, Acts. Second term, Thessalonians and Galatians. Third term, Corinthians and Romans. First and second terms, *Professor* Fowler. Third term, *Professor* Allinson.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. Not offered in 1909–10.

LITERATURE AND HISTORY IN ENGLISH‡

[13, 17, 18. *Old Testament Literature and History*]

First term, early Semitic history, the formative age of Hebrew history, and Hebrew literature before the Monarchy. Second term, history and literature of the Hebrew Monarchy. Third term, Jewish history and literature from the Captivity to the conquest of Alexander. Includes nearly the entire Old Testament history and literature. In connection with 14, 19, 20, gives a comprehensive view of Biblical history and literature. The Biblical books are read in the best English translations. *Professor* Fowler.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Not offered in 1909–10.

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‡ Course 21, 22, 23 gives a rapid survey of the Bible as a part of the world's literature. It is designed especially for those who do not expect to pursue further courses in this department.

Courses 13, 17, 18 and 14, 19, 20 are introductory to more detailed courses in the University or the Theological Seminary. They are also designed for those who, without intending to specialize in this field, desire a comprehensive view of the nature and results of the historical as well as the literary study of the Bible.

14, 19, 20. *New Testament Literature and History*

First term, the Greek, Maccabean, and Roman ages of Jewish history and literature. Second term, the four Gospels and the life of Christ. Third term, the Acts, Epistles, Apocalypse, and the history of the Apostolic age. Includes a large part of the Jewish writings from the conquest of Alexander to the destruction of Jerusalem, and the entire New Testament, studied in its Jewish setting. Emphasis placed upon the connection between the history and the literature. In connection with 13, 17, 18, gives a comprehensive view of Biblical history and literature. The books are read in the best English translations; no knowledge of the original languages is required. *Professor* FOWLER.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Wed., Th., at 10.20.*

21, 22, 23. *The English Bible as Literature*

An outline of the literary history of the Old and New Testaments; the literary forms represented in the Bible; the place of the Bible in English literature. Emphasis placed upon the literature itself and its connection with the present. Lectures and assigned readings from the English Bible. First term, Old Testament literature from the beginning to the fall of Jerusalem in 586 B.C. Second term, from the Babylonian exile to the completion of the Old Testament. Third term, the New Testament. *Professor* FOWLER.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Tu., Th., at 11.20.*

15* *Biblical Seminary*

Subject for 1909–10: Investigation of the sources for the life of Christ. *Professor* FOWLER.

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors.

[16. *Principles of Historical Criticism and Research*]

This course is the same as course 25 offered by the Department of History. *Professor* MACDONALD.

One hour. One term. Elective for Graduates of one year's standing. Required of all candidates for the degree of Doctor of Philosophy in Biblical Literature and History. Not offered in 1909–10.

IV. BIOLOGY ‡

Albert Davis Mead, Ph.D., *Professor of Biology*
Frederic Poole Gorham, A.M., *Associate Professor of Biology*
Herbert Eugene Walter, Ph.D., *Assistant Professor of Biology*
Philip Henry Mitchell, Ph.D., *Instructor in Physiology*
Frank Taylor Fulton, Sc.B., M.D., *Instructor in Pathology and Histology*
Jay Perkins, M.D., *Demonstrator in Anatomy*
John Burnham Ferguson, A.B., M.D., *Demonstrator in Anatomy*

1. *Introductory Course*

Introductory to all other courses in the department; also designed for those who, without intending to pursue the subject further, desire a general view of biological work and biological theories. Aims to give an introduction to laboratory methods of dissection and experiment and the use of the microscope, to afford a general view of the structure and functions of animals and plants, and to present an outline of the more important biological theories, such as evolution, natural selection, variation, mutation, and heredity. After the first term Biology 1 and Botany 1 are identical and the classes are combined. *Professor* Gorham.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. *Mon., Tu., Th., 2.20 to 4.20.*

2. *Comparative Anatomy of Vertebrates*

Intended not only for the general student, but also for those who are particularly interested in zoology and for those who expect to study medicine. The structure and significance of the various organs of vertebrates with particular reference to man. Students are permitted to attend clinics and autopsies at the Rhode Island Hospital. Laboratory work and lectures. *Professor* Walter.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for 1.

3. *Bacteriology*

A general discussion of bacteria in all their relations, with special attention in the laboratory to the methods of studying bacteria, including the isolation, systematic study, and determination of unknown species. Lectures and laboratory work. *Professor* GORHAM.

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‡ It is recommended that the undergraduate courses in Biology be taken in the following order; 1; 2; 10; 4, 5, 3; 7, 8 or 33; 9; 19 or 34, 30, 18; 16 or 17.

Three hours. Six hours of attendance. Third term. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon., Wed., Th., at 10.20.*

4, 5. *Advanced Histology and Pathology*

Advanced work in micro-technic and in normal and pathological histology. Adapted, to some extent, to individual requirements. *Professor* MEAD *and Dr.* FULTON.

Three hours. Six hours of attendance. First and second terms. Elective for Juniors, Seniors, and Graduates, who have credit for 1 and 10.

7. *Chemical Physiology*

Designed both for those who are interested in physiology either from a medical or a general standpoint, and also for those who are specializing in chemistry and desire a knowledge of vital chemical processes. Includes: the chemistry of proteins, carbohydrates, and fats; the physiology of the digestive system, with the study of secretions and of artificial salivary, gastric, and pancreatic digestions; examination of blood, bile, and urine; the analysis of foods with special reference to milk. *Dr.* MITCHELL.

Three hours. Six hours of attendance. First and second terms. Must be preceded by Chemistry 1, 2, 3, and should be preceded by Chemistry 10. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Tu., Fri., Sat., at 10.20.*

8. *Physical Physiology*

The physiology of muscle and nerve; the physics and physiology of the circulatory, respiratory, and alimentary systems; the causes and theories of sleep; the physiology of the special senses. *Dr.* MITCHELL.

Three hours. Six hours of attendance. Third term. Must be preceded by 7. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Tu., Fri., Sat., at 10.20.*

9. *Anatomy of the Nervous System*

A study of the architecture and composition of the brain, nerves, and sense organs in man; comparison with the nervous system of lower vertebrates; relation of nervous structure to mental activity. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1.

10. *Embryology and Histology*

The origin and the development of the individual body, the elementary structure of the adult organs. Practice in micro-technic. Adapted to the requirements of general students and those intending to study medicine. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1.

11. *Biological Theories and Biological Problems*

Seminary course. *Professor* MEAD.

One to three hours. Through the year. Elective for Graduates.

12. *Advanced Bacteriology*

Practical work in the preparation of culture media; methods of sterilization and disinfection; qualitative and quantitative biological examination of water, milk, air, soil, and sewage; study of certain pathogenic organisms, with the determination of their pathogenic properties, and the methods of bacteriological diagnosis of disease. Laboratory work and seminary. *Professor* GORHAM.

Three to twelve hours. Through the year. Elective for Juniors, Seniors, and Graduates, who have credit for 3.

13. *Physiology, advanced course*

Laboratory work and seminary. *Dr.* MITCHELL.

Three to twelve hours. Through the year. Elective for Graduates who have sufficient knowledge of chemistry and physiology.

14. *Human Anatomy*

A course in practical dissection. Laboratory instruction. Students also have an opportunity to attend certain operations at the hospital and to be present at autopsies. *Dr.* PERKINS *and Dr.* FERGUSON.

Three hours. Through the year. Elective for Graduates.

15. *Special Advanced Work*

Research work arranged to meet the requirements of individual students. *Professor* MEAD.

Three to twelve hours. Through the year. Elective for Graduates.

16. *Evolution*

The history of biology, principles of classification, geographical distribution, heredity, natural selection, variation, Mendelism, and the

relationship of man to the lower animals. Lectures and assigned reading. *Professor* MEAD.

Three hours. Third term. Elective for Juniors and Seniors. Not to be offered in 1910–11.

[17. *Physiology*]

A general survey of the activities of living organisms with special reference to the human body, including some applications of modern physiology to healthful living. Lectures and assigned reading. *Dr.* MITCHELL.

Three hours. Third term. Elective for Juniors and Seniors. *Mon., Tu., Th., at 8.* Not offered in 1909–10. To be offered in 1910–11.

18. *Ornithology*

A study of birds regarded as a group of living animals in relation to their environment. Lectures and field identification of wild birds during their spring migration. *Professor* WALTER.

One hour. Two hours of attendance. Third term. Elective for Undergraduates.

[19. *Entomology*]

A study of insects in their scientific and economic relations. Lectures and laboratory work. *Professor* GORHAM.

One hour. Two hours of attendance. First term. Elective for Undergraduates. Not offered in 1909–10. To be offered in 1910–11.

30. *Protozoology*

A consideration of the forms and activities of micro-organisms and their relation to disease. Lectures and laboratory work. *Professors* GORHAM *and* WALTER.

One hour. Two hours of attendance. Second term. Elective for Undergraduates.

31. *Bacteriological Research*

Research work arranged to meet the requirements of individual students. *Professor* GORHAM.

Three to twelve hours. Through the year. Elective for Graduates who have credit for 3 and 12.

32. *Zoological Seminary*

Reading and discussion of German zoological literature selected with reference to the needs of individual students. *Professor* WALTER.

One to three hours. Through the year. Elective for Graduates.

33. *Clinical Analysis*

Aims to furnish practice in methods of analysis used in medical diagnosis. Analysis of urine; examination of blood and of feces; gastric analysis. *Dr.* MITCHELL.

Three hours. Six hours of attendance. Third term. Must be preceded by 7. Elective for Juniors, Seniors, and Graduates, and for Sophomores who are not taking any other course in the department.

34. *Comparative Anatomy of Invertebrates*

A study of some important features of the anatomy of the invertebrates. Lectures and laboratory work. *Professor* GORHAM.

One hour. Two hours of attendance. First term. Elective for Undergraduates. Not to be offered in 1910–11.

V. BOTANY ‡

JAMES FRANKLIN COLLINS, PH.B., *Assistant Professor of Botany*

1. *Introductory Course*

Introductory to other courses in the department; also designed for those who, without intending to pursue the subject further, desire a general view of biological work and biological theories. Aims to give an introduction to laboratory methods of dissection and experiment and the use of the microscope, to afford a general view of the structure and functions of plants and animals, and to present an outline of the more important biological theories, such as evolution, natural selection, variation, mutation, and heredity. After the first term Botany 1 and Biology 1 are identical and the classes are combined.

Three hours. Six hours of attendance. Through the year. Elective for Undergradutes. *Mon., Tu., Th., 2.20 to 4.20.*

2.* *Histology and Physiology*

Minute structure and special functions of plants, and their tissues; embryology; cytology; glycerin and paraffin technic, etc. The work of the third term can be arranged to meet the more special needs of students intending to take up either medicine or forestry. Certain portions of this course may, with the approval of the instructor, be continued by Juniors, Seniors, and Graduates, in course 6.

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‡ Students preparing for teaching or for botanical positions in the government or state experiment station service are advised to supplement courses 1, 2 and 3, 4, 5 with advanced or special work in course 6.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for 1, and for approved Graduates. Not to be offered in 1910–11. Alternates with 3, 4, 5. *Mon.*, *Wed.*, *Fri.*, *at 12.20.*

[3, 4, 5. *Comparative Morphology*]

Intended to give a general view of the evolution and classification of plants by a comparative study of the life-histories of certain types. First term, algae and fungi. Second term, mosses, ferns, etc. Third term, seed plants. Certain portions of this course may, with the approval of the instructor, be continued by Juniors, Seniors and Graduates, in course 6.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for 1, and for approved Graduates. Not offered in 1909–10. To be offered in 1910–11. Alternates with 2.

6.* *Special Course*

Arranged to meet the requirements of individual students. May be taken in successive years if previous work is not duplicated. Students electing this course must plan it definitely, in consultation with the instructor, before June 1 of the preceding academic year. Advanced, special, or research work upon almost any phase of botany may be chosen by students who are properly qualified.

One to three hours. Through the year. Elective for Graduates and for approved Juniors and Seniors. Graduates may, with the consent of the instructor, elect the course for more than three hours. Two to six hours of attendance for approved Juniors and Seniors.

7. *Trees*

Identification of native and introduced trees; characteristic structure of the more common kinds of wood. Lectures and field work. The required field trips will take place in the afternoon unless otherwise specially arranged, the number depending somewhat upon the length of the individual trips and the amount of work accomplished.

One hour. Two hours of attendance. Third term. Required in the Senior year for the degree of Bachelor of Science in Civil Engineering. Elective for other Undergraduates. Lectures, *Wed. at 8.*

VI. CHEMISTRY

JOHN HOWARD APPLETON, A.M., Sc.D., *Newport-Rogers Professor of Chemistry*

JOHN EMERY BUCHER, PH.D., *Associate Professor of Organic Chemistry*

FREDERICK GEORGE KEYES, Sc.M., *Instructor in Chemistry*

SAMUEL JACOB BEEBER, A.B., *Assistant in Chemistry*

1, 2, 3. *Descriptive Chemistry*‡

Non-metals; metals, their metallurgy, compounds, and practical applications; theoretical chemistry. Lectures with experiments; written exercises; individual laboratory work. *Professor* BUCHER, *Messrs.* KEYES, BEEBER, *and* WEED.

Three hours. Through the year. Elective for Undergraduates. *1st div. Mon., Th., at 10.20; 2d div. Tu., Fri., at 10.20; 3d div. Wed., Sat., at 11.20.* Laboratory hours to be arranged with the instructor.

4, 5. *Qualitative Analysis*

First term, properties of the metallic elements; their separation from certain of their compounds. Laboratory work; recitations in qualitative analysis and in chemical philosophy; exercises in stoichiometry. Second term, the principal non-metals and the acids formed by them; methods of separation and recognition of acids and acid radicles. *Professor* APPLETON *and Mr.* GAGER.

Three hours. Six hours of attendance. First and second terms. Elective for Juniors who have credit for 1, 2, 3.‡ *1st div. Fri. at 11.20; 2d div. Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

6. *Quantitative Analysis*

Quantitative precipitations and separations of the most important elements and compounds; the principles upon which quantitative apparatus is constructed; chemical philosophy and stoichiometry continued. Chiefly laboratory work. *Professor* APPLETON *and Mr.* GAGER.

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‡ Credit for the entrance requirement in Chemistry admits only to 1, 2, 3, which may be taken also without previous preparation. Students who wish to enter more advanced courses without taking 1, 2, 3 must pass a special test at the time of the entrance examination in Chemistry. This test will cover the following topics: 1. All of the non-metals with their principal compounds and the processes of manufacture of the chief commercial products from non-metals. 2. About thirty important metals, their occurrence, preparation from the ore, the preparation and uses of their chief compounds. 3. The general principles of chemical action which depend upon physical laws. 4. Methods of making chemical computations of moderate difficulty.

Preparation for this test may require the equivalent of six hours a week for one school year.

Three hours. Six hours of attendance. Third term. Elective for Juniors who have credit for 4, 5. *1st div. Fri. at 11.20; 2d div. Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

7, 8, 9. *Quantitative Analysis, advanced course*

Assaying of metallic ores; analysis of agricultural materials; testing of chemicals used in textile establishments, etc. *Professor* APPLETON *and Mr.* GAGER.

Six hours. Twelve hours of attendance. Through the year. Elective for Seniors and Graduates who have credit for 6. Laboratory hours to be arranged with the instructor.

10, 11, 12. *Organic Chemistry*

Preparation and analysis of representative organic compounds. Lectures, recitations, and laboratory work. *Professor* BUCHER *and Mr.* KEYES.

Six hours. Through the year. First and second terms, three lectures a week and three laboratory periods a week. Elective for approved Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

13. *Assaying*

Professor APPLETON *and Mr.* GAGER.

Six hours. Twelve hours of attendance. Third term. Elective for Seniors and Graduates who have credit for 1–6.

14. *Organic Dyes*

The chemistry and use of mordants, dyes, etc. *Professor* APPLETON *and Mr.* GAGER.

Six hours. Twelve hours of attendance. Third term. Elective for approved Seniors and Graduates.

15, 16, 17. *Industrial Chemistry*

Lectures and laboratory work. *Professor* APPLETON.

Three to six hours. Six to twelve hours of attendance. Through the year. Elective for approved Graduates. Each term may be elected independently.

18, 19, 20. *Physical Chemistry*

Lectures and laboratory work. *Professor* BUCHER.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

[21, 22. *Organic Chemistry, advanced course*]
Professor BUCHER.

Three hours. First and second terms. Elective for approved Graduates. Not offered in 1909–10.

[23. *Inorganic Chemistry, advanced course*]
Professor BUCHER.

Three hours. Third term. Elective for approved Juniors, Seniors, and Graduates. Not offered in 1909–10.

24, 25, 26. *Organic Preparations, advanced course*
Professor BUCHER.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

27, 28, 29. *Inorganic Preparations, advanced course*
Professor BUCHER.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates, who have credit for 10, 11, 12.

30, 31, 32. *Research Work in Chemistry*
Professor BUCHER.

Three hours, or more. Through the year. Elective for Graduates.

33, 34, 35. *Conference on Special Topics in Chemistry*
Professor BUCHER.

One hour. Through the year. Elective for approved students.

36, 37, 38. *Conference on Special Topics in Chemistry*
Professor APPLETON.

One hour. Through the year. Elective for approved students.

VII. CIVIL ENGINEERING‡

JOHN EDWARD HILL, C.E.M., Sc.D., *Professor of Civil Engineering*
ARTHUR HORACE BLANCHARD,† C.E., A.M., *Associate Professor of Civil Engineering*
HENRY BERNARDIN DROWNE, C.E., *Instructor in Civil Engineering*
ALBERT EDDY LEACH, *Assistant in Civil Engineering*

4, 5, 6. *Surveying, elementary course*

Theory and practice of plane surveying; use of tape, compass, level, and transit; adjustment of instruments. Lectures, recitations, field work, and drafting. *Professor* HILL, *Messrs.* DROWNE *and* LEACH.

Three hours. One hour of recitation and usually six hours of field work or drafting. Through the year. Elective for students who have credit for Mathematics 2 or 18, and for Mechanical Drawing 2 or 6. *Tu. at 11.20; Mon., Th., 2 to 5.*

7. *Topographical Drawing*

Pen topography; contour drawing, conventional signs. *Mr.* DROWNE.

One hour. Two hours of drafting. Second term. Not elective. *Mon., Th., 2 to 5.*

8, 9. *Surveying, advanced course*

Topography; city surveying; use of stadia, plane table, and barometer; precise base-line measurements with steel tape. Methods as in 4, 5, 6. *Professor* HILL, *Messrs.* DROWNE *and* LEACH.

Three hours and two hours. Second term. Course 8 is taken during the spring recess. Elective for students who have credit for 4. *Wed., Fri., at 2.20.*

10, 11, 12, 13. *Railroad Engineering*

Theory, location, construction, and economics of railroad engineering. Lectures, recitations, field work, and drafting. Third term, railroad curves and practical problems. First term, actual location of a line about two miles long, map, and estimate of cost. Second term, railroad track and track work, ties, ballast, rails, frogs, switches, etc.; maintenance of way department; economics of location. First term, earthwork and its cost; rock excavation; tunneling. *Professor* HILL *and Mr.* LEACH.

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‡ All the courses in this department except 16 are required of candidates for the degree of Bachelor of Science in Civil Engineering; all except 7 and 32 and 35 are elective for other students.

† On leave of absence during the academic year 1909–10.

Three, four (eight hours of field work), three, and three hours. Third, first, second, and first terms. Courses 10 and 11 are elective for students who have credit for Mathematics 2 or 18, and who have credit for or are taking 6. Courses 12 and 13 are elective for Juniors and Seniors. Third term, *Mon.*, *Th.*, *Sat.*, *at 8.* First term, *Wed. 8 to 5.* Second term, *Tu.*, *Wed.*, *Sat.*, *at 9.20.* First term, *Mon.*, *Th.*, *at 10.20; Fri. 2.20 to 4.20.*

14. *Hydraulic Engineering* ‡

Consideration of water supply mainly from a sanitary standpoint. A general course designed to give the chemical and biological aspects of water supply without laboratory work. Lectures, recitations, and seminary work. *Professor* HILL.

Three hours. Second term. Elective for Juniors and Seniors. *Tu.*, *Fri.*, *Sat.*, *at 10.20.*

15. *Geodesy*

Problems in geodetic surveying, with sufficient theory for a proper understanding of the formulae used. Lectures and computations. *Professor* HILL.

Three hours. One hour of recitation and five hours of computation. Third term. Elective for students who have credit for 6 and 9, and Astronomy 5. *Th. at 10.20 and 1.20 to 6.20.*

16. *Municipal Improvements*

Economic and social aspects of sewerage, water works, pavements, etc. *Professor* HILL.

Three hours. First term. Elective for Juniors and Seniors. Offered only if five or more elect the course. *Mon.*, *Th.*, *Fri.*, *at 9.20.*

17. *Hydraulic Engineering* ‡

Supplements Mechanics 2, which gives the theoretical treatment of the subject. Consideration of water supply mainly from an engineering standpoint. Irrigation, pumps, and pumping machinery; construction of dams and reservoirs. Lectures, recitations, and seminary work. *Professor* HILL.

Four hours. Third term. Elective for students who have credit for Mechanics 2. *Mon.*, *Wed.*, *Fri.*, *Sat.*, *at 9.20.*

18. *Sanitary Engineering* ‡

Sewerage and house drainage; theory of sewerage, treatment and disposal of sewage; stream pollution; appliances used in construction and maintenance; amount and velocity of flow; house drainage and its appliances; garbage collection and disposal. Lectures, recitations, and seminary work. *Professor* Hill.

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‡ Courses 14, 17, and 18 cover the general subject of sanitation.

Four hours. Third term. Elective for students who have credit for Mechanics 2. *Mon., Wed., Fri., Sat., at 10.20.*

19. *Highway Engineering*

Economics and location of country roads; surveys, grades, drainage, and foundations; construction and maintenance of roads of earth, gravel, and broken stone; economics and design of street pavements of asphalt, brick, bitulithic, cobble-stone, stone-block, and wood-block; dust prevention and preservation of macadam roads; methods of testing road materials; roads and pavements in foreign countries. Lectures, recitations, inspection trips, and seminary work. *Mr.* Drowne.

Three hours. Third term. Elective for Sophomores, Juniors, and Seniors. *Mon., Tu., Th., at 8.*

23. *Simple Framed Structures*

The standard forms of simple roof trusses; calculation by analytical methods of stresses due to dead, snow, and wind loads; calculation by analytical methods of stresses in Pratt, Howe, Warren, and parabolic trusses due to dead, wind, uniform live, excess panel live, road roller, and locomotive wheel loads; miscellaneous trusses, skew bridges, cranes, trussed bents, and towers. Lectures, recitations, and seminary work. *Mr.* Drowne.

Three hours. First term. Elective for students who have credit for Mechanics 1 or 3. *Mon., Tu., Th., at 9.20.*

24. *Higher Framed Structures*

General analysis of continuous, movable, cantilever, and suspension bridges and three-hinged, two-hinged, and fixed-end arched ribs; calculations of stresses in continuous and non-continuous center-bearing swing bridges; theorem of three moments; deflection of framed structures; theorem of least work. Lectures, recitations, and seminary work. *Mr.* Drowne.

One hour. Third term. Elective for students who have credit for 23. *Th. at 10.20.*

25. *Elements of Structural Design*

Center of gravity and moment of inertia of combinations of structural shapes; riveted joints, tension members, compression members, combined direct and bending stresses, secondary stresses, columns under direct and eccentric loading; wooden structures; plate girder, pin-connected, and riveted Pratt truss bridges; construction of viaducts and elevated railroads; steel mill-building and high-building construction; comparison of standard structural specifications. Lectures, recitations, and computations. *Mr.* DROWNE.

Three hours. First term. Elective for students who have credit for Mechanics 1 or 3. *Mon., Tu., Th., at 8.*

26. *Roof Design and Graphic Statics*

Graphic determination of center of gravity of combinations of structural shapes; determination by graphical methods of moments in beams and stresses in simple roof trusses; determination of shears, moments, and stresses in simply supported bridge trusses by the use of influence lines; complete design, with general drawings, of a fifty to seventy foot roof truss; revision and discussion of checked drawings; drawing and computations; inspection trips. *Messrs.* DROWNE *and* LEACH.

Three hours. One hour of recitation and four hours of drafting. First term. Elective for students who have credit for Mechanical Drawing 1 or 2, and have credit for or are taking 23 and 25. *Tu. 10.20 to 12.20 and 1.20 to 5.20; Wed. 2 to 5.*

27,‡ 28. *Bridge Design*

Determination of stresses in plate girders; design, with general drawings, of a plate girder highway bridge; design, with general drawings, of a Pratt truss railroad bridge. Lectures on American and English shop practice; the esthetic design of bridges, design of standpipes and elevated tanks, and American methods of erection of bridges and structures. Lectures, drawing, computations, inspection trips, and seminary work. *Messrs.* DROWNE *and* LEACH.

Three hours. Six hours of drafting. Second and third terms. Elective for students who have credit for 26. Second term, *Tu., Th., 1.20 to 4.20.* Third term, *Tu. 10.20 to 12.20 and 1.20 to 5.20.*

29.‡ *Reinforced Concrete Structures*

Properties of reinforced concrete; theory and design of reinforced concrete arches in accordance with the elastic theory; theory and design of reinforced concrete beams, columns, retaining walls, dams, foundations, bridges, and culverts; systems of reinforcement; methods of construction; complete design, with drawings, of a fifty-foot reinforced concrete highway bridge; complete design, with drawings, of a reinforced concrete retaining wall. Lectures, recitations, drafting, and computations. *Messrs.* DROWNE *and* LEACH.

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‡Courses 27, 29, 30 may not be elected separately.

Five hours. Three hours of recitation and four hours of drafting. Second term. Elective for students who have credit for Mechanics 1 or 3 and Mechanical Drawing 1 or 2. *Mon. 9.20; Tu., Th., 9.20 to 12.20.*

30.‡ *Masonry Structures*

Stone masonry; static and elastic theory of the masonry arch; design, with drawings, of a stone arch; theory and design of masonry piers, retaining walls, bridge abutments, and high masonry dams; complete design, with drawings, of a high masonry dam. Lectures, recitations, drafting, and computations. *Messrs.* DROWNE *and* LEACH.

Two hours. One hour of recitation and two hours of drafting. Second term. Elective for students who have credit for Mechanics 1 or 3 and Mechanical Drawing 1 or 2. *Mon. at 8 and 10.20 to 12.20.*

31. *Foundations*

Soundings and borings, foundation-beds, deposition of concrete under water, timber foundations, coffer dams, open caissons, Cushing cylinder piers, pile formulae, driving and foundations, pneumatic caissons of wood and steel, open dredging, the Poetsch freezing process, foundations in quicksand, foundations for high buildings. Lectures, recitations, and seminary work. *Mr.* DROWNE.

Two hours. Second term. Elective for students who have credit for or are taking Mechanics 2. *Tu., Th., at 8.*

32. *Engineering Jurisprudence*

Essential elements of a contract, the parties to a contract, considerations, bids and bidders, work for private parties and public work. Employment of engineers, liability of the engineer as a professional man; when his functions are judicial; when he is a public officer. Real property, water rights, ownership, rights of way, boundaries, incorporeal rights, franchises, and patents. Engineering specifications and accompanying documents. Lectures and discussion of written decisions on typical cases assigned each week. *Mr.* DROWNE.

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‡ Courses 27, 29, 30 may not be elected separately.

Two hours. Third term. Required of candidates for the degree of Bachelor of Science. *Tu., Th., at 9.20.*

34. *Design of Sanitary Works*

Practical applications of the principles of design discussed in courses 17 and 18. Partial design of a sewerage system, water-works system, and filter plant. *Professor* HILL.

One hour. Two hours of drafting and computations. Third term. Elective for students who have credit for or are taking 17 and 18 and have credit for Mechanical Drawing 1 or 2. *Mon. 2.20 to 4.20.*

35. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Civil Engineering. The thesis must embody either a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

36. *Hydraulic Surveying*

Methods of surveying applicable to river and harbor work. Methods of measuring and rating the flow of streams. Actual measurement of the discharge of a stream by means of the current meter, weir, and floats. Recitations and field work. *Mr.* DROWNE.

Two hours. One hour of recitation and two hours of field work. Third term. Elective for students who have credit for 4 and 6 and have taken Mechanics 2. *Mon. at 8; Tu. 8 to 5.20.*

VIII. ECONOMICS‡

HENRY BRAYTON GARDNER, PH.D., *Professor of Economics*
WILLIAM KIRK, PH.D., *Assistant Professor of Economics*

1. *Economics, elementary*

Affords a general outline of the subject, and serves as an introduction to the more extended and special courses which follow. *Professor* GARDNER.

Three hours. Second term. Sophomore, Junior, or Senior year. Must be preceded by Social Science 1. Required of candidates for the degree of Bachelor of Arts; elective for other students who have credit for Social Science 1. *1st div. Tu., Fri., Sat., at 10.20; 2d div., Mon., Wed., Fri., at 12.20.*

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‡The courses in this department other than 1 are open only to those students who have credit for Political Science 1, Economics 1, and Social Science 1, which together constitute an introduction to the advanced work of the departments of Social and Political Science and Economics.

2.* *General Economics*

The development and significance of the more important elements in the existing industrial organization; the principles governing the production, exchange, distribution, and consumption of wealth; the more important practical problems of economic life. First and third terms, *Professor* GARDNER. Second term, *Professor* KIRK.

Three hours. Through the year. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.20.*

3. *Money and Banking*

Principles of money and banking; recent monetary and banking history, particularly of the United States; monetary and banking systems of leading industrial nations; present monetary and banking problems. *Professor* GARDNER.

Three hours. First and second terms. Elective for Juniors, Seniors, and Graduates. Not to be offered in 1910–11. *Wed., Fri., Sat., at 11.20.*

[4. *Public Finance*]

First term, general principles of public finance; revenues and expenditures of leading industrial nations. Second term, financial history of the United States. Third term, local finance: revenues, expenditures, and financial systems of American states and cities. *Professor* GARDNER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Not offered in 1909–10. To be offered in 1910–11.

5. *History and Present Tendencies of Economics*

Early economic theories: a critical examination of the theories of the early schools of economists, especially the physiocrats and the early English school, with particular attention to the relation between economic thought and economic life and practice. Recent economic theories: a study of the tendencies of the historical school, the Austrian school, and recent English and American writers. The growth of the principle of monopoly, its influence on the production and distribution of wealth and on the economic well-being of society. *Professors* GARDNER *and* KIRK.

Three hours. One session of an hour and a half weekly. Through the year. Elective for Seniors and Graduates who have credit for 2. Hours to be arranged with the instructor.

6. *The Labor Movement*

History and analysis of the trade-union movement; growth of collective bargaining; labor problems in the United States. *Professor* KIRK.

Three hours. First term. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

7. *Socialism*

A brief review of the historically important socialistic schemes; mainly a study of the modern scientific socialism of Karl Marx and of the resulting socialistic movements. *Professor* KIRK.

Three hours. Second term. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

8. *Industrial Corporations*

Development of the corporate form of business organization; its effects; the problems to which it gives rise. Special emphasis on the recent movements toward combination, and toward state control of corporations, particularly quasi-public corporations. *Professor* GARDNER.

Three hours. Third term. Elective for Juniors, Seniors, and Graduates. Not to be offered in 1910–11. *Wed., Fri., Sat., at 11.20*

[9. *The Tariff*]

The arguments for free trade and protection in relation to the principles of international trade; the history of tariff legislation and its effects in the United States. *Professor* KIRK.

Three hours. Third term. Elective for Juniors, Seniors, and Graduates. Not offered in 1909–10. To be offered in 1910–11.

10, 11, 12, *Industrial History*

First term, the chief stages in the development of the industrial life of England, with special emphasis on the origin and development of the existing form of industrial organization. Second term, the more important aspects of the industrial development of the colonies and the United States to 1860. Third term, the growth, organization, and geographical distribution of the main branches of industry since 1860; the relation of the industrial life of the United States to that of the world at large. *Professor* GARDNER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. *Tu., Th., Sat., at 12.20.*

13. *Economic and Commercial Geography*

A study of the physical features of the land; of climate, winds, ocean currents and their relation to man; of the geographical distribution of food-stuffs and raw materials of industry; and of the consequent development of commerce and of civilization in its economic aspects. Lectures and conferences. This course is the same as Geology 12. *Professors* Brown *and* Kirk.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Wed., Th., at 10.20; Fri. 2.20 to 4.20.*

20, 21, 22. *Investigation of Special Topics*

Intended to train the student in methods of gathering, handling, and presenting data in the study of economic life and problems. Laboratory methods. *Professors* Gardner *and* Kirk.

Three hours. Six hours of attendance. Through the year. Elective for approved Juniors, Seniors, and Graduates. Each term may be elected independently. Students desiring to elect these courses must obtain the consent of Professor Gardner or Professor Kirk before the close of the academic year preceding that in which the course is to be taken.

IX. ENGLISH‡

Walter Cochrane Bronson, A.M., Litt.D., *Professor of English Literature*

Lindsay Todd Damon, A.B., *Professor of Rhetoric*

Albert Knight Potter, A.M., *Associate Professor of the English Language*

George Wyllys Benedict, Ph.D.,† *Associate Professor of English*

Thomas Crosby, A.M., *Assistant Professor of English and Public Speaking*

Henry Barrett Huntington, A.B., *Assistant Professor of English*

Howard Bristol Grose, Jr., Ph.B., *Instructor in English*

William Thomson Hastings, A.M., *Instructor in English*

George Rupert MacMinn, A.B., *Instructor in English*

Stanley Bates Harkness, A.B., *Instructor in English*

Lawrence Rich Grose, A.M., *Assistant in English*

1. *Rhetoric and Composition*

Lectures and recitations upon the principles governing prose style, prescribed reading and themes. Designed to give the student a clear and correct style and some critical standards. *Professors* Damon *and* Huntington, *Messrs.* H. B. Grose, Hastings, MacMinn, Harkness *and* L. R. Grose.

Three hours. Through the year. Required of all Freshmen. *1st, 2d, 3d, and 4th div. Mon., Tu., Th., at 11.20; 5th, 6th, 7th, and 8th div. Mon., Wed., Fri., at 12.20; 9th and 10th div. Tu., Th., Fri., at 3.20.*

2.* *English Composition, second course*

Lectures, recitations, and prescribed reading; weekly themes and other written exercises. Intended to supplement the training given in 1, and to develop further the power of exact and lucid statement. *Mr.* H. B. Grose.

Three hours. Through the year. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

3.* *English Composition, advanced course*

Frequent practice in composition and criticism. Intended to develop ease of style and clarity and vigor of thought. *Professor* Damon.

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‡ Credit for English 1 is a prerequisite for admission to all other courses in English. The requirement in English Literature for the degree of Bachelor of Arts may be satisfied by taking any one of the courses from 10 to 23 inclusive.

† On leave of absence during the academic year 1909–10.

Three hours. Through the year. Elective for Juniors and Seniors, and with the permission of the instructor for Sophomores who have attained the grade of C in 1. With the consent of the instructor the course may be repeated. *Mon., Tu., Th., at 2.20.*

[4.* *Argumentative Composition*]

Lectures on the principles and forms of argumentative composition; frequent practice in brief-drawing and the writing of forensics and less formal arguments. Intended to develop the power of handling argumentative topics cogently and persuasively. *Professor* HUNTINGTON.

Three hours. Through the year. Elective for Juniors and Seniors. Not offered in 1909–10. To be offered in 1910–11.

5. *Argumentative Composition*

The principles and forms of brief-drawing and forensic writing. Lectures, written exercises, briefs, and forensics. Intended to furnish a more rapid training than 4, for students who wish to begin debate as early as possible or to go quickly over the fundamentals of argumentative composition. *Professor* HUNTINGTON.

Three hours. Two hours of attendance. First term. Elective for Juniors and Seniors. Not elective for students who have taken 4. *Mon. at 3.20; Fri. at 2.20.*

6.* *Debate*

Intended to train students in correct and vigorous oral presentation of ideas. *Professor* HUNTINGTON, *with the coöperation of the Professors of Economics, Social and Political Science, History, and Public Speaking.*

Three hours. Second and third terms. Elective for a limited number of Juniors and Seniors who have credit for 5 or for one or more terms of 4. With the consent of the instructor the course may be repeated. *Mon. 3.20 to 5.20; Fri. 2.20 to 4.20.*

7. *Public Speaking*

Principles of voice culture; vocal interpretation of literature; extempore speaking. *Professor* CROSBY.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Wed., Fri., Sat., at 11.20.*

[8. *Public Speaking, advanced course*]

Practice in reading lyric, narrative, and dramatic literature, in extempore speaking, and in the composition and delivery of the common forms of the occasional address. Special attention to securing right tone-production and to improvement in speech. *Professor* CROSBY.

Three hours. Through the year. Elective for a limited number of Juniors and Seniors who have credit for 7. Not offered in 1909–10.

9. *Old English*

Essentials of Anglo-Saxon grammar; prose selections; Béowulf. *Professor* POTTER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 3.20.*

10. *Chaucer*

Careful reading of most of Chaucer's works; study of Middle English grammar, with some attention to the development of Modern English. *Professor* POTTER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 4.20.*

11. *English Literature from the Beginning to the Present Time*

An outline course in the history of English literature, with reading and study of the greater writers. *Professor* BRONSON, *assisted by Messrs.* MACMINN *and* HARKNESS.

Three hours. Through the year. Elective for Sophomores. *Tu., Th., Sat., at 12.20.*

[12. *English Literature exclusive of the Drama, from 1400 to 1600*]

Medieval literary forms and the transition to the modern period: romance, ballad, allegory, satire, Elizabethan novels and lyrics. *Professor* BENEDICT.

Three hours. Through the year. Elective for students who have credit for 10 and one other of the courses from 9 to 23 inclusive. Not offered in 1909–10.

[13. *History of the Drama in England*]

The drama as a literary type and its history in England to 1642. *Professor* POTTER.

Three hours. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. Not offered in 1909–10. To be offered in 1910–11.

18. *The Modern English Drama*

Preliminary study of Elizabethan plays; reading and study of the greater playwrights from 1642 to the present day. *Professor* CROSBY.

Three hours. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. *Mon., Tu., Th., at 11.20.*

14. *Shakspere*

Careful study of a few plays with special attention to exact interpretation. In 1909–10 the plays read will be *Othello, Henry V., King Lear, All's Well that Ends Well, Antony and Cleopatra, The Tempest. Mr.* HASTINGS.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Fri., Sat., at 10.20.*

15. *Shakspere*

Shakspere as dramatist and poet; reading of all the plays. *Professor* POTTER.

Three hours. Through the year. Elective for Juniors and Seniors. *Tu., Th., Sat., at 12.20.*

[16. *English Literature exclusive of the Drama, from 1600 to 1660*]

The decline of the Elizabethan spirit; Puritanism and Anglicanism in literature; the "metaphysical" and mystical poets; the cavalier lyrists; all the English poems and some of the prose works of Milton. *Professor* BRONSON.

Three hours. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. Not offered in 1909–10.

[17. *English Literature from 1660 to 1798*]

The Restoration drama; the classical school; development of the essay and the novel; the beginnings of romanticism. *Professor* HUNTINGTON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. Not offered in 1909–10.

19. *English Literature from 1798 to 1832*

The romantic revolt in its critical and imaginative phases; influence of the French revolution; individualism in form and spirit. *Professor* HUNTINGTON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Wed., Sat., at 9.20.*

20. *English Literature from 1832 to 1892*

The Victorian period; modifications of romanticism in prose and poetry; realism; the influence of science and democracy; tendencies at the end of the century. *Professor* DAMON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon., Wed., Th., at 10.20.*

[50. *The Modern Novel*]

A study of the currents of modern life and thought as expressed in some of the best novels of the nineteenth century. *Professor* DAMON.

Three hours. Third term. Elective for Sophomores and Juniors who have taken French 50 and German 50. Not offered in 1909–10.

22. *American Literature*

American literature from the beginning in its relation to American life and to English literature. *Professor* BRONSON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for 11, 19, or 20. *Mon., Tu., Th., at 3.20.*

23. *Seminary in English Literature*

Subject for 1909–10: Studies in Tennyson and Browning. *Professor* BRONSON.

Three hours. Two hours of attendance. Through the year. Elective for Graduates, and for a limited number of Seniors who have attained the grade of C in two of the courses from 9 to 22 inclusive.

X. GEOLOGY‡

CHARLES WILSON BROWN, A.M., *Assistant Professor of Geology*
————————————————, *Assistant in Geology*

3. *General Geology*

A discussion of the origin, weathering, and metamorphism of rocks; of other agencies that have affected the formation and development of the earth and its crust; of certain land-forms and the stages of their development; a review of earth changes, with special reference to the development of the North American continent; the types of life characteristic of the different periods, and the principles of organic evolution they illustrate. Lectures, illustrated by models and lantern views. One-third of the first term will be devoted to laboratory work. Two field trips will be taken in the first term and three in the third term. *Professor* BROWN *and Mr.* ——.

Three hours. Through the year. Elective for Undergraduates, except Sophomores who elect 1. *Tu., Fri., Sat., at 10.20.*

6. *Dynamical and Structural Geology*

An advanced course dealing with sedimentary formations old and new; with mineral veins, folds, faults, mountain-making, and other characteristics of crustal movements; and with the nature and results of igneous and metamorphic activities.

Three hours. One term. Offered if applied for. Elective for students who have credit for 3 or 16.

1. *Mineralogy and Petrography*

Discussion of crystal forms and laws of crystallography; the more common minerals and ores and their recognition and determination by their physical properties and by blow-pipe analysis; study of the optical properties of the rock-forming minerals under the polarizing microscope; the exact determination of rocks; a discussion of the fundamental principles of the origin and classification of rocks and ores. Lectures and laboratory work. *Professor* BROWN *and Mr.* ——.

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‡ Students who wish a general view of the geologic processes concerned in the development of the earth and its life should take course 3. Those who contemplate teaching physical geography should take also courses 12, 9, 8, 13. Students who desire to specialize in mining engineering, geology, or geography, in order to teach or to obtain appointment on government or state geological surveys, are advised to elect first the work in general geology and to follow it with courses 1, 11, 9, 8, 6, 12, 13, approximately in the order given.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores who do not elect 3, and for Juniors and Seniors. *Tu. and Th. at 11.20.*

9, 8, 11. *Field Geology*

Geological maps, their use and methods of construction; practice in the actual working out of the surface geology and stratigraphy of an assigned definite area. Field work and reports.

Three hours. Through the year. One conference hour to be arranged with the instructor and the equivalent of six hours' work in the field-area. Elective for Juniors, Seniors, and Graduates. The first term may be taken independently and is elective for students who have credit for 3 or 16; the first and second terms may be elected as a two-term course; the third term may be elected independently by students who are taking 3 or 16.

17, 16. *Engineering Geology*

A discussion of the geologic processes and results that are closely related to engineering problems. Lectures, laboratory and field work. The first term includes laboratory work upon the rock-forming minerals, typical rocks, and building stones. Two field trips in the first term and three in the third term are required, with detailed notes of the regions visited. *Professor* BROWN *and Mr.* ——.

Two hours (four hours of attendance), three hours. First and third terms. Required in the Junior year for the degree of Bachelor of Science in Civil Engineering. Not elective. *Tu. 9.20 to 11.20; Fri. 10.20 to 12.20; Mon., Wed., Fri., at 10.20.*

12. *Economic and Commercial Geography*

A study of the physical features of the land; of climate, winds, ocean currents and their relation to man; of the geographical distribution of food-stuffs and raw materials of industry; and of the consequent development of commerce and of civilization in its economic aspects. Lectures and conferences. This course is the same as Economics 13. *Professors* BROWN *and* KIRK.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Wed., Th., at 10.20; Fri. 2.20 to 4.20.*

13. *Geographic Seminary*

Discussions and reports on the more advanced problems of geography.

Three hours. One hour of attendance. Through the year. By special arrangement with the instructor, the course may be taken for a shorter period. Elective for Graduates, for Undergraduates who have passed the first term's work in course 12, and for others who have had sufficient preliminary training in Physiography. *Sat. at 11.20.*

14. *Geologic Investigation*

Research work in the field and the laboratory, arranged to meet the needs of individual students.

Through the year. By special arrangement with the instructor, the course may be taken for a shorter period. Elective for qualified Graduates and for from one to six hours for approved Undergraduates.

XI. GERMANIC LANGUAGES AND LITERATURES‡

CAMILLO VON KLENZE, PH.D., *Professor of the Germanic Languages and Literatures*

ASA CLINTON CROWELL, PH.D., *Associate Professor of the Germanic Languages and Literatures*

JOHANNES BENONI EDUARD JONAS, PH.D., *Assistant Professor of the Germanic Languages and Literatures*

ROBERT MCBURNEY MITCHELL, A.B., *Instructor in German*

1. *Introductory Course*

Reading, grammar, composition, conversation, dictation, sight reading. *Professors* CROWELL *and* JONAS, *Mr.* MITCHELL.

Three hours. Through the year. Required of all students who did not present German for admission. *1st div. Tu., Wed., Sat., at 9.20; 2d div. Mon., Th., Fri., at 9.20; 3d div. Tu., Th., Sat., at 12.20; 4th div. Mon., Tu., Th., at 2.20.*

2. *Intermediate Course*

Reading of modern German stories (of the type found in Batt and Allen's *German Stories,* volumes 1 and 2), lyrics (von Klenze or Hatfield), and one or two dramas of the classical period. Review of grammar; composition; conversation based upon the texts read. *Professor* JONAS *and Mr.* MITCHELL.

Three hours. Through the year. Required of all Freshmen who presented elementary German for admission. Not elective for students who have taken German in college. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Fri., Sat., at 10.20; 3d div. Mon., Wed., Th., at 10.20.*

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‡ Students wishing recommendations to teach German from the Department of Germanic Languages and Literatures must pass a special examination designed to test their ability to write and to understand German, and, to some extent, to use the spoken language.

3, 4, 5. *Reading Course*

Reading of modern German stories (of the type found in Batt and Allen's *German Stories,* volumes 1 and 2), lyrics (von Klenze or Hatfield), and two dramas illustrating respectively the classical and the modern period (for example, Schiller's *Maria Stuart* and Hebbel's *Agnes Bernauer*). Review of grammar; composition; conversation based upon the texts read. *Professor* CROWELL.

Three hours. Through the year. Elective for students who have credit for 1. *Mon., Wed., Th., at 10.20.*

6. *Modern Prose*

Aims to train the student in reading, speaking, writing, and understanding modern German. Reading of texts selected from fiction, history, and science (for example, Liliencron, Keller, Freytag, Helmholtz, Nichols' *Modern German Prose*), and a text (such as Mosher's *Willkommen in Deutschland*) to introduce the student to the actual language of modern daily life. Talks in German; oral and written reports in German; letter-writing, composition, and conversation. *Professors* VON KLENZE *and* JONAS.

Three hours. Through the year. Elective for students who have credit for 1 or 2, or 3, 4, 5, and for students who presented advanced German for admission. *Tu., Fri., Sat., at 10.20.*

7. *Advanced Course in Standard Authors, Classical and Modern*

One drama of Goethe or Schiller, one drama of Grillparzer, one drama of Hebbel, Keller's *Romeo und Julie auf dem Dorfe,* Sudermann's *Frau Sorge.* Talks in German on the history of German literature; oral and written reports in German. *Mr.* MITCHELL.

Three hours. Through the year. Elective for students who have credit for 2, and for students who presented advanced German for admission. *Mon., Tu., Th., at 11.20.*

[23, 24, 25. *German Lyrical Poetry*]

Introduces the student to the various aspects of the inner life of the German people as reflected in the lyrical poetry of the last two centuries. Lectures in German; oral and written reports in German.

Three hours. Through the year. Elective for students who have credit for 5 or 7, or who presented advanced German for admission; also for other approved students. Each term may be elected independently. Not offered in 1909–10.

[26, 27, 28. *The German Short Story*]

Kleist, Ludwig, Storm, C. F. Meyer, Keller, Rosegger. A study of the origin of the short story and its development in the nineteenth century, with frequent references to its chief representatives in France, England, and America. Lectures in German; oral and written reports in German.

Three hours. Through the year. Elective for students who have credit for 2 or 5. Each term may be elected independently. Not offered in 1909–10.

29, 30, 31. *The German Drama of the Nineteenth Century*

Kleist, Grillparzer, Hebbel, Hauptmann, and Sudermann. A study of the development of the German drama from waning romanticism to realism, with frequent references to the chief representatives of the modern drama in other countries. *Professor* CROWELL.

Three hours. Through the year. Elective for students who have credit for 5, 6, or 7. Each term may be elected independently. *Mon., Th., Fri., at 9.20.*

[32. *Lessing and Schiller*]

A study of the life and representative works of each author and the problems they present. *Professor* CROWELL.

Three hours. Through the year. Elective for students who have credit for 5 or 7. Not offered in 1909–10.

[10. *Goethe's Faust: Parts* 1 *and* 2]

With some notice of recent dramas of kindred interest. *Professor* CROWELL.

Three hours. Through the year. Elective for students who have credit for 5 or 7. Not offered in 1909–10.

33, 34, 35. *Goethe: A Study of His Life and Works*

Lectures in German; reports on assigned topics; extensive reading. *Professor* VON KLENZE.

Three hours. Through the year. Elective for students who have credit for 7, 10, 14, 25, 28, 31, 32, 35. *Tu., Th., Fri., at 4.20.*

[12, 13, 14. *Outline History of German Literature*]

Aims to acquaint the student with the most important movements in the evolution of German literary life. Lectures in German; reports on assigned topics; extensive reading. *Professor* VON KLENZE.

Three hours. Through the year. Elective for students who have credit for 7, 10, 25, 28, 31, 32, 35. Not offered in 1909–10.

[16. *Gothic and Old High German*]

The Gothic language, with reading of extracts in Streitberg's *Gotisches Elementarbuch* or Braune's *Gotische Grammatik*, Braune's *Althochdeutsche Grammatik* and *Althochdeutsches Lesebuch*. *Professor* CROWELL.

Three hours. Through the year. Elective for Graduates. Not offered in 1909–10.

17. *Germanic Mythology*

Primitive Germanic religion, customs, and ideas, in their relations to German literature. Discussions based on E. Mogk's *Germanische Mythologie*. *Professor* CROWELL.

One hour. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon. at 3.20.*

20. *Old Norse*

Holthausen's *Altisländisches Elementarbuch*; Wilken's *Prosaische Edda*; *Die Lieder der Edda*, edited by Sijmons and Gering. *Professor* CROWELL.

Two hours. Through the year. Elective for Graduates. Students electing Old Norse should also take Germanic Mythology. *Tu., Th., at 12.20.*

15. *Middle High German*

The language of the Middle High German period, including an introduction to Germanic philology. Michel's *Mittelhochdeutsches Elementarbuch*; *Das Nibelungenlied*. *Professor* VON KLENZE.

Three hours. Through the year. Elective for students who have credit for 7, 10, 14, or 16. *Tu., Th., Fri., at 3.20.*

36. *Seminary in German Literature*

Aims to give training in modern methods of investigation and criticism. To be carried on in German. Subject for 1909–10: To be announced later. *Professor* VON KLENZE.

Three hours. One session weekly. Through the year. Elective for approved students.

[50. *The Classical Literature of Germany in English*]

A study of Lessing, Schiller, and Goethe, by means of English translations, in the light of the German culture of the eighteenth century, with supplementary lectures on the German drama of the nineteenth century. *Professor* VON KLENZE.

Three hours. Second term. Elective for Sophomores and Juniors who have taken French 50. Not offered in 1909–10.

XII. GREEK LITERATURE AND HISTORY‡

James Irving Manatt, Ph.D., LL.D., *Professor of Greek Literature and History*

Francis Greenleaf Allinson, Ph.D., *David Benedict Professor of Classical Philology*

————————————, *Assistant in Greek*

A, B, C. *Elementary Course*

Designed to cover as much as possible of the entrance requirements in Greek, and thus to enable a student to take 1, 2, and 3 in the following year if he completes by private study before the opening of the first term the entire requirement in the *Anabasis*, and before the opening of the third term the entire requirement in Homer. *Mr.* ——.

Three hours. Through the year. Elective for students who did not present elementary and advanced Greek for admission. *Tu., Th., Sat., at 12.20.*

3. *Lysias*

Selections from Lysias; selections for sight reading from Herodotus. *Professor* Allinson.

Three hours. First term. Elective for students who presented elementary and advanced Greek for admission, or who have credit for Greek A, B, C and have done the additional work indicated above. *Tu., Th., Sat., at 12.20.*

1. *Plato*

Plato's *Apology* and *Crito*, with selections from the *Phaedo*. *Professor* Allinson.

Three hours. Second term. Elective for students who have credit for 3. *Tu., Th., Sat., at 12.20.*

2. *Homer*

The *Odyssey*, four books; rapid reading of other books; lectures on the life of the Heroic Age as revealed in the poems and illustrated by recent archaeological research. *Professor* Manatt.

Three hours. Third term. Elective for students who have credit for 1. *Tu., Th., Sat., at 12.20.*

4. *Lucian*

Selected writings. *Professor* Allinson.

Three hours. First term. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

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‡ Courses 3, 1, 2 are a prerequisite for the more advanced courses in this department.

35. *Greek Historians*

Selections from Herodotus, Thucydides, and Xenophon, with a general review of Greek History. *Professor* MANATT.

Three hours. Second term. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

6. *Dramatic Poets*

Lectures on the Greek drama. The *Prometheus* of Aeschylus; the *Oedipus Tyrannus* of Sophocles. *Professor* ALLINSON.

Three hours. Third term. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

8. *Homer*

Advanced course in the *Iliad* or the *Odyssey,* intended to serve as an introduction to prehistoric archaeology and as a preparation for teaching Homer. *Professor* MANATT.

Three hours. First term. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

9. *Theocritus and Herondas*

Twenty *Idylls* of Theocritus and selected *Mimes* of Herondas. *Professor* MANATT.

Three hours. Second term. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

7. *Plato and Aeschylus*

Republic, book X; selections from books I-IX; *Agamemnon. Professor* ALLINSON.

Three hours. Third term. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

[10. *The Drama*]

The *Medea* of Euripides and the *Frogs* of Aristophanes, with rapid reading of the *Seven against Thebes* of Aeschylus for literary criticism. *Professor* ALLINSON.

Three hours. Third term. Elective for Juniors and Seniors. Not offered in 1909–10.

[11. *Herodotus*]

A study of Greek History down to the beginning of the Athenian Empire. Collateral reading of Aeschylus' *Persae;* and (in translation) Plutarch's *Solon, Themistocles,* and *Aristides. Professor* MANATT.

Three hours. First term. Elective for Juniors and Seniors. Not offered in 1909–10.

[12. *Thucydides*]

The Rise and Fall of the Athenian Empire. Collateral reading of Aristophanes' *Acharnians* and *Knights;* and Plutarch's *Cimon, Pericles,* and *Alcibiades. Professor* MANATT.

Three hours. Second term. Elective for Juniors and Seniors. Not offered in 1909–10.

[13. *Lucian*]

Advanced course. *Professor* ALLINSON.

Three hours. First term. Elective for Juniors and Seniors. Not offered in 1909–10.

[14. *Aeschines and Demosthenes*]

Speeches on the Crown; study of the Macedonian period and of Athenian political life. *Professor* MANATT.

Three hours. Second term. Elective for Juniors and Seniors. Not offered in 1909–10.

[15. *Pindar*]

Select Odes. *Professor* MANATT.

Three hours. Third term. Elective for Juniors and Seniors. Not offered in 1909–10.

[16, 17, 18. *Homer*]

The *Odyssey;* portions of the *Iliad* and the *Hymns* in the original; the remainder of the poems in translation. *Professor* MANATT.

Three hours. Through the year. Elective for Juniors and Seniors. Not offered in 1909–10.

19, 20. *Greek Composition*

Professor ALLINSON.

One hour. Second and third terms. Elective for Sophomores, Juniors, and Seniors. *Fri. at 2.20.*

21, 22. *Modern Greek*

Introduction to the language; readings from living Greek authors and Greek newspapers. *Professor* MANATT.

One hour. Second and third terms. Elective for Sophomores, Juniors, and Seniors.

23, 24, 25. *Greek Seminary*

Subjects for 1909–10: Hesiod and the Homeric Hymns; the Greek Anthology; Isaeus and Greek historical inscriptions, or Comparative Philology (*see* Indo-European Philology 4). First and third terms, *Professor* MANATT. Second term, *Professor* ALLINSON.

One two-hour session weekly. Through the year. Elective for Graduates and approved Seniors.

[26. *Attic Orators*]

Professor MANATT.

Two hours. First term. Elective for Graduates and approved Seniors. Not offered in 1909–10.

[27, 28. *Homer and Mycenaean Archaeology*]

The Achillean books of the *Iliad* and the Ithacan books of the *Odyssey* studied in the light of recent archaeological discoveries. *Professor* MANATT.

Two hours. First and second terms. Elective for Graduates and approved Seniors. Not offered in 1909–10.

[29. *Demosthenes*]

Private speeches, selected to illustrate the workings of Athenian institutions. *Professor* MANATT.

Three hours. First term. Elective for Graduates. Not offered in 1909–10.

30, 31, 32. *Hellenistic Greek*

Characteristics of Hellenistic Greek (ἡ κοινή). The *Apologies* of Justin Martyr, or selections from the *New Testament*. This course is the same as course 12 offered by the department of Biblical Literature and History. First and second terms, *Professor* FOWLER. Third term, *Professor* ALLINSON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 2.20.*

[33. *Greek Life*]

The private and public life of the Greeks studied in the light of their history, literature, and monuments. Manual, lectures, and prescribed reading, with frequent reports, written tests, and essays. No knowledge of Greek or Latin required. The course is continued in the second and third terms as Latin 28, 29. The three terms together constitute the course in the History of Greek and Roman Life and

Institutions, which alternates with Greek 34, Latin 30, and Indo-European Philology 1. *Professor* MANATT.

Three hours. First term. Elective for Freshmen and Sophomores. Not offered in 1909–10.

34. *Greek Literature*

A brief history of the literature of the Greeks from Homer to Theocritus, with study of the masterpieces in the best English translations. No knowledge of Greek or Latin required. This course is continued in the second and third terms as Latin 30 and Indo-European Philology 1. The three terms together constitute the course in Greek and Roman Literature and the History of Language, which alternates with Greek 33, Latin 28, 29. *Professor* ALLINSON.

Three hours. First term. Elective for Freshmen and Sophomores. *Mon., Tu., Th., at 11.20.*

XIII. HISTORY‡

WILLIAM MACDONALD, PH.D., LL.D., *Professor of History*
WILFRED HAROLD MUNRO, A.M., *Professor of European History*

1. *Medieval and Modern History of Europe*

A general survey of the history of western Europe from the time of the barbarian invasions to 1815. A narrative text-book supplemented by lectures, frequent written tests, and written reports and abstracts on assigned reading and topics for special investigation. *Professor* MACDONALD.

Three hours. Through the year. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy in either the Sophomore or the Junior year. *Mon., Tu., Th., at 2.20.*

2. *Spanish History*

Development of Spanish institutions, political and social; rise and greatness of Spain as a European power; its colonial system; its position with reference to the Reformation and the subsequent religious wars. *Professor* MUNRO.

Three hours. First term. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.20.*

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‡ The elective courses in History are regularly open only to those who have credit for 1; but, by special permission of the instructor, elective courses may be taken by Juniors who are at the same time taking 1.

3. *Islam and the Crusades*

Social and political conditions in Europe and the East at the beginning of the Crusades; organization and internal condition of Islam; effect of the Crusades on the thought, life, and political development of Europe. *Professor* Munro.

Three hours. Second term. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.20.*

4. *Period of the Renaissance*

Preparation for the Renaissance in the intellectual and social life of Europe; spread of the revival; connection between the Renaissance and the Reformation; artistic and literary aspects of the movement. *Professor* Munro.

Three hours. First term. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

5. *Period of the Reformation*

Early movements of dissent from the Roman Church; the Protestant revolt in Germany, Switzerland, France, and England; the political and social aspects of the Reformation; the religious wars; the effect on religious belief and church organization. *Professor* Munro.

Three hours. Second term. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

6. *The French Revolution*

Rise and progress of the Revolution in France; political and social conditions in Europe 1789–1815; permanent results of the Revolution, particularly its effect on political thought and practice. *Professor* Munro.

Three hours. Third term. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.20.*

7. *European History since 1815*

Political development of the more important states and their diplomatic relations; the revolutions of 1830 and 1848; the free-trade movement in England; the achievement of Italian unity; the founding of the German Empire; the Franco-Prussian war; the Eastern question, etc. *Professor* Munro.

Three hours. Third term. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

8, 9, 10. *English Constitutional and Political History to 1689*
Formation of the English constitution; establishment and growth of the church; relations with Scotland and Ireland; the Reformation; the Puritan Revolution. *Professor* MUNRO.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Tu., Th., at 2.20.*

[11,12,13. *English Constitutional and Political History since 1689*]
Foreign relations; the development of party government and the cabinet system; the social and political changes of the nineteenth century. *Professor* MUNRO.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. Not offered in 1909–10. To be offered in 1910–11.

14, 15, 16. *Seminary in European History*
Discussion of assigned subjects, reports of reading and investigation, and similar exercises. *Professor* MUNRO.

Three hours. One hour of class-room attendance. Through the year. Elective for Graduates. Each term may be elected independently.

19, 20, 21. *Constitutional and Political History of the United States*
An advanced course covering the period from 1783 to the present time. Intended primarily for students who wish to specialize in American history or who expect to study law. *Professor* MACDONALD.

Three hours. Two meetings a week. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., at 12.20.*

22, 23, 24. *Seminary in American History*
Designed to afford training in historical investigation and practice in the use of sources. The subjects vary from year to year, and are drawn from both the colonial and the constitutional periods. For 1909–10 the subjects are: First term, Early exploration and settlement of the West. Second term, The administrations of Monroe. Third term, The South during the Civil War. *Professor* MACDONALD.

Three hours. One hour of attendance. Through the year. Elective for Graduates and approved Seniors. The course should be preceded by 27, 28, 29, or 19, 20, 21, but by special permission it may be taken by students who are taking 27, 28, 29, or 19, 20, 21.

27, 28, 29. *American History*

A general course, covering the whole period from the beginnings of English colonization to the end of the Civil War. Lectures, supplemented by assigned reading, study of the texts of representative documents, and special reports. Intended as an introduction to the advanced courses in American history, and for students who wish only a general survey of the subject or who expect to teach history. *Professor* MacDonald.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

[25.* *Principles of Historical Criticism and Research*]

The general principles of historical criticism and the literature of historical theory. Langlois and Seignobos's *Introduction to the Study of History* is used as a manual. *Professor* MacDonald.

One hour. One term. Elective for Graduates of one year's standing. Required of all candidates for the degree of Doctor of Philosophy in History. Not offered in 1909–10.

XIV. INDO–EUROPEAN PHILOLOGY

Francis Greenleaf Allinson, Ph.D., *David Benedict Professor of Classical Philology*

1. *General Introduction to the Study of Language*

Outline of the history of language; the Indo-European family. Adapted for students of ancient or modern languages. A continuation of Greek 34, Latin 30. The three terms together constitute the course in Greek and Roman Literature and the History of Language.

Three hours. Third term. Elective for Freshmen and Sophomores. *Mon., Tu., Th., at 11.20.*

4. *Seminary in Comparative Philology*

For advanced students in Greek and Latin.

One two-hour session weekly. Third term. Elective for Graduates and approved Seniors.

7, 8, 9. *Sanskrit, elementary course*

Whitney's *Grammar;* Lanman's *Reader;* selections from the *Vedic Hymns.*

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

[10, 11, 12. *Sanskrit, advanced course*]

Vedic Hymns, and other selections.

One hour. Through the year. Elective for students who have credit for 7, 8, 9. Not offered in 1909–10.

XV. MATHEMATICS‡

NATHANIEL FRENCH DAVIS, A.M., LL.D., *Professor of Pure Mathematics*

HENRY PARKER MANNING, PH.D., *Associate Professor of Pure Mathematics*

FREDERICK SLOCUM, PH.D., *Assistant Professor of Astronomy*

ROLAND GEORGE DWIGHT RICHARDSON, PH.D., *Assistant Professor of Pure Mathematics*

RAYMOND CLARE ARCHIBALD,† PH.D., *Instructor in Mathematics*

ALLAN BENTON MORTON, A.M., *Instructor in Mathematics*

ROBERT KERSHAW BENNETT, *Assistant in Mathematics*

3. *Algebra*

Professors MANNING *and* RICHARDSON, *Messrs.* MORTON *and* BENNETT.

Four hours. First term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Tu., Wed., Fri., Sat., one division at 8, the others at 9.20.*

1. *Solid and Spherical Geometry*

Professors DAVIS *and* RICHARDSON, *Messrs.* MORTON *and* BENNETT.

Four hours. Second term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Tu., Wed., Fri., Sat., one division at 8, the others at 9.20.*

2. *Trigonometry*

Professors DAVIS, MANNING, *and* RICHARDSON, *Messrs.* MORTON *and* BENNETT.

Four hours. Third term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Tu., Wed., Fri., Sat., one division at 8, the others at 9.20.*

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‡ The Undergraduate courses 1–11 should be taken in the order in which they are printed. Courses 12, 13, 14 may be taken at any time after the Freshman year. Courses 17–21 are designed for students who are taking or who intend to take engineering courses. Courses 22–26 are designed for Graduates: two or three of these courses are offered each year according to the needs of the students. For those who have taken all of them, other courses can usually be arranged.

† On leave of absence during the academic year 1909–10.

4. *Analytic Geometry*

Professors Davis *and* Slocum.

Three hours. First and second terms. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. Elective for students who have credit for 1, 2, 3. *Mon., Wed., Fri., at 12.20.*

5. *Differential and Integral Calculus*

Professors Davis *and* Slocum.

Three hours. Third term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. Elective for students who have credit for 4. *Mon., Wed., Fri., at 12.20.*

6, 7, 8. *Differential and Integral Calculus*

A continuation of 5. *Professor* Slocum.

Three hours. Through the year. Elective for students who have credit for 5. *Tu., Th., Sat., at 12.20.*

9, 10, 11. *Differential Equations*

Professor Manning.

Three hours. Through the year. Elective for students who have credit for 6 or 21. First term required of candidates for the degree of Bachelor of Science in Electrical Engineering. *Mon., Wed., Fri., at 8.*

[12. *Determinants and Theory of Equations*]

Three hours. Second term. Elective for students who have credit for 3 or 16. Not offered in 1909–10.

13. *Modern Methods of Analytic Geometry*

Professor Manning.

Three hours. Third term. Elective for students who have credit for 4 or 19.

[14. *Solid Analytic Geometry*]

Professor Manning.

Three hours. Third term. Elective for students who have credit for 4 or 19. Not offered in 1909–10.

15. *Spherical Trigonometry*

Professor Davis.

One hour. First term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane

Trigonometry for admission. Elective for students who have credit for 2 and who have not taken Spherical Trigonometry. *Mon., Th., at 9.20.*

16. *Algebra*

Professors Davis, Manning, *and* Slocum.

One hour, first term. Two hours, second and third terms. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. *Mon., Th., at 9.20.*

17. *Algebra*

Professors Davis, Manning, *and* Slocum, *Mr.* Morton.

Six hours. First term. Required of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., one division at 12.20, the others at 11.20.*

18. *Plane and Spherical Trigonometry*

Professors Davis, Manning, *and* Richardson, *Mr.* Morton.

Six hours. Second term. Required of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., one division at 12.20, the others at 11.20.*

19. *Analytic Geometry*

Professors Davis, Manning, *and* Slocum, *Mr.* Morton.

Six hours. Third term. Required of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., one division at 12.20, the others at 11.20.*

20. *Differential Calculus*

Professors Davis, Slocum, *and* Richardson.

Five hours. First term. Required of candidates for the degree of Bachelor of Science. *One division, Tu., Wed., Th., Fri., Sat., at 9.20. Two divisions, Mon., Th., at 8; Tu., Fri., Sat., at 10.20.*

21. *Integral Calculus*

Professors Davis, Slocum, *and* Richardson.

Three hours. Second and third terms. Required of candidates for the degree of Bachelor of Science. *One division, Tu., Wed., Sat., at 9.20. Two divisions, Tu., Fri., Sat., at 10.20.*

22. *Theory of Functions*

Professor Manning.

Three hours. Through the year. Elective for Graduates and approved Seniors.

[23. *Differential Equations, advanced course*]
Professor Manning.

Three hours. Through the year. Elective for Graduates who have credit for 22. Not offered in 1909–10.

24. *Advanced Algebra*
Professor Richardson.

Three hours. Through the year. Elective for Graduates and approved Seniors.

[25. *General Theory of Curves and Surfaces*]
Professor Manning.

Three hours. Through the year. Elective for Graduates and approved Seniors. Not offered in 1909–10.

[26. *Quaternions and allied subjects*]
Professor Manning.

Three hours. Through the year. Elective for Graduates and approved Seniors. Not offered in 1909–10.

XVI. MECHANICAL ENGINEERING‡

William Herbert Kenerson, M.E., A.M., *Associate Professor of Mechanical Engineering*
Thurston Mason Phetteplace, Ph.B., M.E., *Assistant Professor of Mechanical Engineering*
George Thomas Huxford, *Assistant in Mechanical Engineering*
Henry Dewees Cady, *Instructor in Shop Practice*

1, 2, 3. *Wood-work*

Exercises in carpentry, wood-turning, and pattern-making. *Mr.* Cady.

Three hours in any term. Seven hours of attendance. Elective for Sophomores, Juniors, and Seniors, who have had instruction in drawing. *Tu. 2.20 to 5.20; Fri. 2.20 to 6.20.*

4, 5, 6. *Metal-work*

Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. *Mr.* Cady.

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‡ All the courses in this department are required of candidates for the degree of Bachelor of Science in Mechanical Engineering. Courses 1–6 are all elective for Sophomores, Juniors, and Seniors, but not more than two of them may be counted towards the degree of Bachelor of Arts or Bachelor of Philosophy.

Three hours in any term. Seven hours of attendance. Elective for Sophomores, Juniors, and Seniors, who have had instruction in drawing. *Wed. 2.20 to 5.20; Fri. 2.20 to 6.20.*

8. *Kinematics*

Velocity ratios, rolling surfaces, cams, and belting. Recitations, drawing, and the solution of problems. *Professor* PHETTEPLACE.

Three hours. Seven hours of attendance. Third term. Elective for students who have credit for Mechanical Drawing 5. *Tu. 12.20 to 1.20, 2.20 to 5.20; Fri. 2.20 to 5.20.*

9, 10, 11. *Kinematics*

Gearing, linkwork, parallel motions, and gear trains; machine tools; the application of the principles involved. Recitations, drawing, and the solution of problems. *Professor* PHETTEPLACE.

Three hours. Seven hours of attendance. Through the year. Elective for students who have credit for 8 and for Mechanical Drawing 5. *Mon. 2 to 6; Th. 2.20 to 5.20.*

12, 13, 14, 15. *Machine Design*

Applications of the principles of mechanics and the strength of materials to the design of representative types of boilers, engines, and various mechanisms; solution of problems illustrating the method of designing bolts and nuts, keys, journals and bearings, fly-wheels, valve gears, etc. Lectures, calculation, and drawing. *Professor* PHETTEPLACE.

Three hours. Six hours of attendance. First, second, third, and third terms. Elective for students who have credit for 8, 9, 10, 11 and Mechanics 1. *Mon., Th., 10.20 to 1.20.*

16, 17, 18. *Thermodynamics*

Applications of the principles of gases and vapors to steam, gas, and other heat engines, air-compressors, refrigerating apparatus, etc.; discussion of the energy of fuel and the utilization of such energy for power purposes by means of various media; laws of the relation of variations of pressure, temperature, and volume of such media; analysis of the various cycles used in heat engines; the principles of the injector and the ejector. *Professor* KENERSON *and Mr.* HUXFORD.

Three hours. Through the year. Elective for students who have credit for Physics 1, 2, 3. First and second terms, *Wed., Fri., Sat., at 12.20.* Third term, *Mon., Wed., Th., at 9.20.*

19, 20, 21. *Engineering Practice*

Applications of the principles of thermodynamics and mechanics to the production, transmission, utilization, and measurement of power; valves and valve gears, and valve setting; indicator practice and tests of various forms of steam engines, gas engines, etc.; standardization of auxiliary apparatus used in making the various tests; boiler testing; flue gas and fuel analysis, etc. Lectures, recitations, and laboratory work. *Professor* KENERSON *and Mr.* HUXFORD.

Three hours. Through the year. Elective for students who have taken or are taking 16, 17, 18. First and second terms, *Tu.*, *Wed.*, *Sat.*, *at 9.20; Tu. 2.20 to 4.20.* Third term, *Mon.*, *Th.*, *at 8; Tu. 2.20 to 4.20.*

22. *Materials of Engineering*

Study of the sources, manufacture, and properties of the important materials used in engineering; laboratory tests to determine the behavior of materials when subjected to tensile, compressive, and torsional stresses; mixing and testing of cements and mortars; preparation and examination of sections for the microscopical study of the structure of metals and alloys. Lectures, recitations, and laboratory work. *Professor* KENERSON *and Mr.* HUXFORD.

Three hours. First and second terms. Elective for students who have taken Mechanics 3. *Wed.*, *Fri.*, *at 10.20. 1st div. Mon. 2.20 to 4.20; 2d div. Tu. 2.20 to 4.20; 3d div. Th. 2.20 to 4.20; 4th div. Mon. 9.20 to 11.20.*

23. *Power Plant Engineering*

Discussion of the relation and coördination of the various parts of the complete power plant; management, and methods of determining efficiency; selection of the best equipment from manufacturers' catalogues and actual inspection. Lectures, recitations, tests, and tours of inspection. *Professor* PHETTEPLACE.

Three hours. First term. Elective for students who have credit for 19, 20, 21. *Wed.*, *Fri.*, *2.20 to 5.20.*

24. *Advanced Laboratory Course*

Investigation of special problems in hydraulic and steam engineering. Determination of experimental constants for the Venturi meter, flow of water over weirs and through pipes, flow of air, steam, etc. Particular emphasis laid on preparation and form of reports. *Professor* KENERSON *and Mr.* HUXFORD.

Three hours. Second term. *Wed.*, *Fri.*, *2 to 5.*

25. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Mechanical Engineering. The thesis must embody a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XVII. MECHANICS AND MECHANICAL DRAWING

OTIS EVERETT RANDALL, PH.D., *Professor of Mechanics and Mechanical Drawing*

ANSEL BROOKS, PH.B., M.E., *Assistant Professor of Mechanics and Mechanical Drawing*

WILLIAM ARTHUR KENNEDY, PH.B., SC.B., *Instructor in Mechanical Drawing*

MECHANICS

1. *Mechanics of Solids*

Statics, including resolution and composition of forces, determination of center of gravity, and problems relative to rigid bodies and flexible cords; dynamics, including rectilinear and curvilinear motion, virtual velocity, moment of inertia, work, energy and power, and friction; strength of materials, including tension, compression, shearing, torsion, flexure, and arches; methods of graphical solution of problems. *Professors* RANDALL *and* BROOKS.

Three hours. Through the year. Elective for students who have credit for Mathematics 4 and 5, and who have taken or are taking Mathematics 6. First and second terms required of all candidates for the degree of Bachelor of Science. *Mon., Tu., Th., at 11.20.*

3. *Strength of Materials*

Tension, compression, shearing, torsion, flexure, arches, and graphical solution of problems. *Professors* RANDALL *and* BROOKS.

Six hours. Third term. Required of all candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., at 11.20.*

2. *Mechanics of Fluids*

Hydrostatics; nature and use of instruments; flow through orifices, over weirs, through tubes, through pipes, in conduits, flow of rivers, water supply and water power, dynamic pressure of water, water wheels, turbines, pumps and pumping. *Professor* RANDALL.

Three hours. First and second terms. Required of all candidates for the degree of Bachelor of Science. Elective for students who have credit for 3. *Wed., Fri., Sat., at 11.20.*

4. *Advanced Mechanics*

Comprehensive treatment of the principles of kinematics, statics, and kinetics; strength of materials; higher theoretical and practical problems. *Professor* RANDALL.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 3.

MECHANICAL DRAWING

6. *Elementary Mechanical Drawing*

Nature, care, and use of drafting instruments; lettering; plane problem construction; curve tracing; elementary projection. *Professor* BROOKS *and Mr.* KENNEDY.

Two hours. Four hours of drawing. Through the year. Required in the Freshman year of candidates for the degree of Bachelor of Science. *Tu., Fri., 2.20 to 4.20; Wed. 2 to 6.*

1. *Descriptive Geometry*

Discussion, proof, and graphic solution of problems relating to the point, line, and plane, line and surface generation and classification, surface tangency, intersections and developments; application of the principles of descriptive geometry in isometric drawing, shades and shadows and perspective, machine drawing, and practical engineering problems. *Professors* RANDALL *and* BROOKS, *Mr.* KENNEDY.

Three hours. Two hours of recitation and three hours of drawing. Through the year. Required in the Sophomore year of candidates for the degree of Bachelor of Science. Elective for students who have credit for 2 or 6. *Mon., Th., Fri., and Tu., Wed., Sat., at 9.20; Tu., Fri., Sat., at 10.20.*

2. *Elementary Mechanical Drawing*

Nature, care, and use of drafting instruments; plane problem construction; theory of orthographic and isometric projection. *Professor* BROOKS *and Mr.* KENNEDY.

Three hours. Six hours of drawing. First term. Elective for Freshmen who are candidates for the degree of Bachelor of Philosophy, and for all Sophomores, Juniors, and Seniors. *Mon., Wed., Th., at 10.20.*

3. *Descriptive Geometry*

Discussion, proof, and graphic solution of problems in descriptive geometry. *Professor* Brooks *and Mr.* Kennedy.

Three hours. Two hours of recitation and two hours of drawing. Second and third terms. Elective for Freshmen who are candidates for the degree of Bachelor of Philosophy, and for Sophomores, Juniors, and Seniors who have credit for 2. *Mon., Wed., Th., at 10.20.*

4, 5. *Machine Drawing*

Study and representation of machine parts; the principles of elementary machine design; sketches, detail and assembly drawings of machines; practice in reading drawings. *Professor* Brooks *and Mr.* Kennedy.

Three hours. One hour of recitation and eight hours of drawing. First and second terms. Required of candidates for the degree of Bachelor of Science in Mechanical Engineering or Electrical Engineering. Elective for students who have credit for 3. *Tu. at 12.20; Mon., Th., 2.20 to 5.20.*

8. *Mechanical Drawing, practical*

For students desiring to continue their course in drawing without taking the theoretical work of descriptive geometry. Intersections and developments; third quadrant projection; sketching and dimensioning; conventional methods of representing machine parts; detailing and assembling; exercises in reading drawings; architectural drawing, including the drawing of plans and elevations, and the details of building construction. *Professor* Brooks *and Mr.* Kennedy.

Three hours. Six hours of drawing. Second and third terms. Elective for students who have credit for 2. *Mon., Wed., Th., at 10.20.*

XVIII. PHILOSOPHY

William Herbert Perry Faunce, A.M., D.D., LL.D., *Professor of Moral and Intellectual Philosophy*

Edmund Burke Delabarre, Ph.D., *Professor of Psychology*

Walter Goodnow Everett, Ph.D., *Professor of Philosophy and Natural Theology*

Walter Ballou Jacobs, A.M., *Professor of the Theory and Practice of Education*

Alexander Meiklejohn, Ph.D., *Professor of Logic and Metaphysics*

Arthur Upham Pope, A.M., *Instructor in Philosophy*

1. *Logic*

Aims, methods, and limitations of human thinking; a preparation for work in the sciences and in philosophy. First term, general introduction and formal logic. Second term, principles and methods of the natural sciences. Third term, relations of science to philosophy; philosophical interpretation and criticism of the results of science. *Professor* Meiklejohn *and Mr.* Pope.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon., Th., Fri., at 9.20.*

2. *Psychology, introductory course*

The main facts and laws of mental life, with particular attention to their arrangement in a scientific system. The course aims to provide a sound foundation for further acquaintance with this and allied subjects, for an improved judgment in dealing with many practical problems of life, and for beginning the study of philosophy. *Professor* Delabarre.

Three hours. Through the year. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

3. *Psychology, advanced course*

A seminary for the discussion of important and interesting questions in psychology. The course may be extended over several years if desired. In the first year are usually studied the problems of mental composition, of the relation of mind and body, and of the criteria for accepting evidence for the more unusual or apparently marvelous phenomena to which the name psychical research is ordinarily applied. Special problems for study are arranged with individual students who desire to pursue the subject for a longer period, or who have had more than one year of previous preparation. *Professor* DELABARRE.

Three hours. Through the year. Elective for Undergraduates and Graduates who have taken course 2 or its equivalent.

4. *Experimental Psychology, introductory laboratory course*

Description of the main lines and results of experimental research; demonstrations by the instructor or the class; training in the use of apparatus and in careful scientific observation and measurement. *Professor* DELABARRE.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates, who have taken or are taking 2. Although essentially a year course, it may, by special arrangement with the instructor, be taken for a shorter period.

5. *Experimental Psychology, advanced laboratory course*

The problems investigated vary and the course may be taken two or more years in succession. The aim is to study further the problems of experimental psychology, and, whenever possible, to make original contributions to scientific knowledge. *Professor* DELABARRE.

One to six hours. Two to twelve hours of attendance. Through the year. Elective for students who have credit for 4. May be taken for more than six hours by Graduates.

6, 7, 8. *History of Philosophy*

The successive philosophical systems in their dialectical development and mutual relations; treatment not merely analytic and historical, but synthetic and constructive as well. First term, Greek philosophy. Second term, medieval and early modern philosophy. Third term, recent and contemporary philosophy. *Professor* EVERETT.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

9, 10. *Theoretical Ethics*

Intended to aid in mastering the fundamental problems of life and character. First term, a discussion of the nature and relations of ethics and an outline of the history of the chief ethical systems. Second term, a critical study of the fundamental concepts of ethics with the aim of constructing a tenable theory of conduct. *Professor* EVERETT.

Three hours. First and second terms. Elective for Juniors, Seniors, and Graduates. *Tu., Wed., Sat., at 9.20.*

11. *Practical Ethics*

The application of ethical theory to the life of the individual, the family, and the state. Discussion of current problems, personal, industrial, and social, from the ethical standpoint. *President* FAUNCE.

Three hours. Third term. Elective for Juniors and Seniors. *Tu., Wed., Sat., at 9.20.*

12. *Philosophy of Religion*

A study of the nature of the religious consciousness and of the ultimate problems of religious belief. *Professor* EVERETT.

Three hours. Third term. Elective for Seniors and Graduates who have credit for one course in Philosophy. *Tu., Wed., Sat., at 9.20.*

13, 14, 15. *Philosophical Seminary*

Lectures, written reports, and discussions on the more difficult problems of philosophy. Subject for 1909–10 to be announced later. *Professor* EVERETT.

Three hours. Through the year. Elective for Graduates.

[16. *Kantian and Post-Kantian Philosophy*]

Kant's *Critique of Pure Reason* studied as a source of modern philosophical theories. *Professor* MEIKLEJOHN.

Three hours. Through the year. Elective for Seniors who have credit for 6, 7, 8, and for Graduates. Not offered in 1909–10.

17. *Metaphysics*

A seminary for the discussion of special problems in metaphysical theory. Reading, written reports, and discussions. *Professor* MEIKLEJOHN.

Three hours. Through the year. Elective for Seniors who have credit for 6, 7, 8, and for Graduates.

EDUCATION‡

Professor JACOBS

1. *History of Education*

Education among the early culture peoples as forming and perpetuating their civilization; the development of education in Greece and

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‡ Courses 1, 2, and 3 treat education in its relation to the individual and to the social and political whole; interest in them is therefore not limited to those who intend to teach. At the same time they form an introduction to the more advanced courses in Educa-

Rome as parallel to the development of thought and learning; early Christian education; the renaissance and humanism; the rise of realism in thought and education. The history of education considered from the point of view of the history of civilization.

Three hours. First term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

2. *Critical Study of Modern Education*

The beginnings of modern education; the naturalistic movement—Rousseau; the psychological movement—Pestalozzi, Froebel, Herbart; the scientific movement—Spencer; recent sociological tendencies; industrial education; the present status of higher education; problems which an adequate theory of education must solve.

Three hours. Second term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

3. *Fundamental Principles of Education*

The meaning and aim of education; the function of education as a social institution; the physical conditions of education; the aim of instruction; apperception; the choice and arrangement of studies; the principles of method; the use of the type in instruction; the training of the will; moral education.

Three hours. Third term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

4. *Psychology of Education*

Theory and process of mental development, with special emphasis upon the period of adolescence; psychology of method, and of the various studies and disciplines; ways in which student and teacher may utilize a knowledge of the more fundamental activities of the mind.

Three hours. First term. Elective for Seniors and Graduates who have credit for 1, 2, or 3, or who are taking 1. *Mon., Tu., Th., at 11.20.*

5. *Hygiene of Education*

A study of bodily growth and development; special emphasis upon

tion. Those who intend to teach are advised to elect these courses during the Junior year.

Courses 1–6 cover the usual requirements for certificates of the First Grade except where practice teaching or experience is demanded. In Rhode Island a certificate is required of all teachers in schools supported in whole or in part by public money. Certificates of the First Grade are granted without examination to those who have completed courses 1–6 and hold a college degree. Due credit is also given for separate courses.

Certificates, authorizing the holders to teach in the evening schools of the State, are issued without examination to students who have completed three years of regular work, including Education 1–3.

the period of adolescence; play and fatigue; physical culture and athletics; arrested growth; the conditions and surroundings which favor or retard normal development; the hygiene of mind; school hygiene.
Three hours. Second term. Elective for Seniors and Graduates who have credit for 1, 2, or 3, or who are taking 2. *Mon., Tu., Th., at 11.20.*

6. *Practical Introduction to Teaching*
The method of the recitation; management and discipline of classes; observation of good teaching; practical applications of method.
Three hours. Third term. Elective for Seniors and Graduates who have taken or are taking other courses in Education. *Mon., Tu., Th., at 11.20.*

7, 8, 9. *Methods in Secondary School Studies and the Organization, Equipment, and Management of Secondary Schools*‡
Importance and meaning of secondary school studies; their organization into a curriculum; method as applied to each subject; the resources at the command of the teacher. The following studies receive special attention: first term, Latin and Modern Languages; second term, History and English; third term, Science and Mathematics.
Three hours. Two hours of class-room attendance. Through the year. Required of student-teachers. Elective for Graduates and experienced teachers. *Wed. 3.20 to 5.20.* Each term may be elected independently.

10, 11, 12. *Problems in Practical Teaching; Secondary Schools*‡
Practice teaching in the Providence High Schools under experienced teachers. Observation, reports, and conferences. Designed for those who wish to become instructors in colleges, teachers or principals in secondary schools, or superintendents of schools.
Three hours. Through the year. Elective for approved Graduates who have credit for elementary courses in Education and who are taking 7, 8, 9 and 16, 17, 18. *Fri. at 3.20*, and at other hours to be arranged.

13, 14, 15. *Problems in Practical Teaching; Grammar Grades*‡
Practice teaching in the Providence Grammar Schools under experienced teachers. Observation, reports, and conferences. Designed especially for those who wish to become grade teachers, principals of grammar schools, or superintendents of schools, but also for those who wish to teach in secondary schools. The following studies re-

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‡ In connection with this course, and for an explanation of the work of student-teachers, see the Catalogue, page 160.

ceive special attention: first term, Arithmetic; second term, Language; third term, History and Geography.

Three hours. Through the year. Elective for approved Graduates who have credit for elementary courses in Education and who are taking 16, 17, 18; also by special permission for a limited number of Seniors. *Mon. at 3.20*, and at other hours to be arranged.

16, 17, 18. *Seminary in Education* ‡

Reviews and discussions of recent publications; reports on special studies undertaken by members. The subjects vary from year to year. For 1909–10 they are: first term, Industrial Education; second term, The Administration of Schools; third term, Social Phases of Education.

Three hours. Through the year. Two hours of class-room attendance. Required of student-teachers. Elective for Graduates and experienced teachers. *Sat. 10.20 to 12.20.* Each term may be elected independently.

XIX. PHYSICS

Carl Barus, Ph.D., LL.D., *Hazard Professor of Physics*
Albert deForest Palmer, Jr., Ph.D., *Associate Professor of Physics*
Arthur Eugene Watson, Ph.D., *Assistant Professor of Physics*
Robert Franklin Field, A.M., *Assistant in Physics*

1, 2, 3. *Elementary Physics* § ‖

First term, kinematics and dynamics. Second term, molecular physics. Third term, electricity. Lectures, illustrated by experiments and the lantern; weekly written exercises corrected in detail by the instructors. Designed for those who have had little previous training in physics. *Professor* Barus.

Three hours. Through the year. Elective for Undergraduates who have credit for Mathematics 1, 2, 3. *Mon., Wed., Th., at 10.20.*

4, 5, 6. *Elementary Physics, continued* § ‖

First term, optics. Second term, acoustics, polarization of light. Third term, heat. Methods as in 1, 2, 3. *Professor* Barus.

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‡ In connection with this course, and for an explanation of the work of student-teachers, see the Catalogue, page 160.

§ Graduates taking courses 1, 2, 3, 4, 5, 6 are held responsible for all the demonstrations, or for the full equivalent of either Watson's or Daniel's *Principles of General Physics.*

‖ Students who intend to teach physics should elect courses 1, 2, 3; 4, 5, 6; 7.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for 1, 2, 3. *Tu., Fri., Sat., at 10.20.*

7. *Physical Measurements*‡

Elementary theory and practice of physical manipulation. Reports of experiments and solution of problems. *Professor* PALMER *and Mr.* FIELD.

Three hours. Six hours in the laboratory. Through the year. Elective for students who have credit for 1, 2, 3, or 4, 5, 6.

8, 9, 10. *Mathematical Treatment of Dynamical Problems*§

Lectures. First term, discussion of the general principles of dynamics and the development of the general equations of motion. Second and third terms, application of these principles to special problems in thermodynamics and hydrodynamics. *Professor* PALMER.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 7 and Mathematics 9.

11, 12, 13. *Mathematical Theory of Electricity and Magnetism*§

Lectures. Includes a discussion of the more important problems of electrical science. *Professor* PALMER.

Three hours. Through the year. Elective for Graduates and Seniors who have credit for 7 and Mathematics 9.

14, 15, 16. *Advanced Laboratory Course*

Special problems and reference to original sources for methods of solution. *Professors* BARUS, PALMER, *and* WATSON.

Three or six hours. Six or twelve hours of attendance. Through the year. Elective for students who have credit for 7.

17, 18, 19. *Applied Harmonic Analysis and Applied Vector Analysis*||

Importance of Fourier's method shown by examples drawn from the analytical theory of heat, from elastics, alternating electricity, and elsewhere; treatment by the aid of spherical harmonics, Bessel functions, and Lamé functions; the chief theorems of vector analysis deduced and applied to dynamics, elastics, hydrodynamics, the electro-

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‡ Students who intend to teach physics should elect courses 1, 2, 3; 4, 5, 6; 7.

§ In determining which of the two courses 8, 9, 10, and 11, 12, 13, shall be offered in any given year, the preference of applicants will be considered.

|| In determining which of the two courses 17, 18, 19 and 20, 21, 22 shall be offered in any given year, the preference of applicants will be considered.

magnetics of Maxwell and Hertz, and the electronic theory of Heaviside, Lorentz, and others. *Professor* BARUS.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 1, 2, 3 and Mathematics 6, 7, 8.

20, 21, 22. *Physics, advanced course*‡

Lectures on dynamics, potential, elastics, hydrostatics, hydrodynamics, viscosity, capillarity, electrostatics, magnetism, electro-magnetism, thermo-electrics, induction, Fresnel's optics, the electro-magnetic theory of light, thermal analytics, and thermodynamics. Completed in two years. *Professor* BARUS.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for Mathematics 6, 7, 8.

23. *Precision Measurements in Photometry, Electricity, and Magnetism*

Professor PALMER.

Three hours. Six hours in the laboratory. Through the year. Elective for students who have credit for 7 or 24 and Mathematics 6.

24. *Theory of Measurements*

Lectures on the theory and precision of measurements and on methods of taking, recording, and reducing observations; laboratory instruction in selected physical measurements. *Professor* PALMER *and Mr.* FIELD.

Three hours. One lecture and three hours in the laboratory. Through the year. Elective for students who have credit for 1, 2, 3 or 4, 5, 6 and Mathematics 6 or 21. *Mon. at 12.20.*

ELECTRICAL ENGINEERING§

Professor WATSON

1, 2, 3. *General Course*

First term, instruction in methods of generating and utilizing electric currents. Second term, technical study of the theory and working of direct current dynamo-electric machinery. Third term, laboratory practice in operating and testing various sizes and types of standard dynamos and accessory apparatus; lectures on alternating current machinery.

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‡ In determining which of the two courses 17, 18, 19 and 20, 21, 22 shall be offered in any given year, the preference of applicants will be considered.

§ All the courses in this department are required of candidates for the degree of Bachelor of Science in Electrical Engineering. Courses 1, 2, 3 are required of candidates for the degree of Bachelor of Science in Mechanical Engineering. Courses 1 and 2 are required of candidates for the degree of Bachelor of Science in Civil Engineering.

Three hours. Through the year. Elective for students who have taken or are taking Physics 3 and 7 and Mathematics 5 or 20. First term, *Mon., Th., Fri., at 9 20.* Second term, *Mon., Th., at 9.20;* one laboratory period. Third term, *Mon. at 9.20;* two laboratory periods.

4, 5, 6. *Alternating Currents*

Mathematical and graphical treatment.

Three hours. Two hours of recitation and two hours of laboratory work. Through the year. Elective for students who have credit for 3 and who have taken or are taking Mathematics 9. *Mon., Th., at 10.20;* one laboratory period.

7, 8, 9. *Industrial Electricity*

First term, telephone and telegraph engineering. Second term, history of electrical engineering. Third term, design and calculation of direct current machinery, including actual drawing of electrical machinery in connection with Mechanical Engineering 11.

Three hours. Through the year. Not elective. To be taken with 1, 2, 3. First term, *Tu., Wed., at 9.20; Sat. at 11.20.* Second and third terms, *Tu., Fri., at 9.20; Sat. at 11.20.*

11. *Special Topics in Electrical Engineering I*

Design and calculation of alternating current machinery.

Three hours. Second term. Elective for students who have credit for 1, 2, 3. *Tu., Wed., Fri., at 10.20.* Must be taken with 12.

12. *Special Topics in Electrical Engineering II*

Central station design and equipment; systems of distribution.

Three hours. Second term. Elective for students who have credit for 1, 2, 3. *Tu., Fri., at 11.20,* and a third period for trips of inspection or special assignments of work. Must be taken with 11.

13. *Specific Electrical Engineering Problems*

Reading and discussion. Seminary method.

Three hours. Third term. Not elective. *Tu., Wed., Fri., at 10.20.*

14. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Electrical Engineering. The thesis must embody a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XX. ROMAN LITERATURE AND HISTORY

Albert Granger Harkness, A.M., *Professor of Roman Literature and History*

John Francis Greene, A.M., *Assistant Professor of Roman Literature and History*

1. *Livy*

Designed to enable the student to acquire facility in reading Latin, and to instruct him in the use of the Latin texts as a means of gaining a knowledge of Roman history; grammatical study and literary criticism also receive attention. *Professors* Harkness *and* Greene.

Three hours. First term. Elective for students who presented elementary and advanced Latin for admission. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Sat., at 12.20.*

2. *Cicero's Letters*

Aims and methods as in 1. *Professors* Harkness *and* Greene.

Three hours. Second term. Elective for students who presented elementary and advanced Latin for admission. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Sat., at 12.20.*

3. *Tacitus' Germania and Agricola*

Aims and methods as in 1. *Professors* Harkness *and* Greene.

Three hours. Third term. Elective for students who presented elementary and advanced Latin for admission. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Sat., at 12.20.*

4. *Horace's Odes and Epodes*

Critical study of the poems, supplemented by rapid reading with a view to comprehending the spirit of the author; the literary side of the study is made prominent. Lectures; literary topics assigned to the class for special study. *Professor* Harkness.

Three hours. First term. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

5. *Catullus, Tibullus, and Propertius*

Aims and methods as in 4. *Professor* Greene.

Three hours. Second term. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

6. *Satires of Horace*

Aims and methods as in 4. *Professor* Greene.

Three hours. Third term. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

7, 8, 9. *Latin Poetry*

Aims to give a connected and comprehensive view of the history and development of Latin poetry. Forms with 10, 11, 12 a two-year consecutive course affording a general survey of Roman literature. Lectures on the lives and writings of the authors; reading of characteristic selections; special study by members of the class of assigned topics in literary history and criticism. First term, Plautus. Second term, Lucretius. Third term, Juvenal and Martial. *Professors* HARKNESS *and* GREENE.

Three hours. Through the year. Elective for Juniors and Seniors. Each term may be elected independently. *Tu., Fri., Sat., at 10.20.*

[10, 11, 12. *Latin Prose*]

Aims to give a connected and comprehensive view of the history and development of Latin prose. Forms with 7, 8, 9 a two-year consecutive course affording a general survey of Roman literature. Lectures on the lives and writings of the authors, on the development of oratory, etc.; reading of characteristic selections; special study by members of the class of assigned topics in literary history and criticism. First term, specimens of early Latin, Cicero's *Brutus,* and Quintilian. Second term, Cicero. Third term, the *Annals* of Tacitus. *Professors* HARKNESS *and* GREENE.

Three hours. Through the year. Elective for Juniors and Seniors. Each term may be elected independently. Not offered in 1909–10.

13, 14, 15. *Petronius, Pliny the Younger, Martial*

Professor HARKNESS.

One hour. Through the year. Elective for Juniors, Seniors, and Graduates. *Fri. at 2.20.*

[16, 17, 18. *Epigraphy*]

Professor HARKNESS.

Two hours. Through the year. Elective for Graduates and approved Undergraduates. Not offered in 1909–10.

22, 23, 24. *Latin Composition*

Professor GREENE.

One hour. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon. at 3.20.*

25, 26, 27. *Seminary in Latin*

Subject for 1909–10: Paleography and textual criticism. Reading from the prose of the Empire. Gudeman's *Latin Literature of the Empire*, vol. I. *Professors* HARKNESS *and* GREENE.

Two hours. Through the year. Elective for Graduates.

[28, 29. *Roman Life*]

The private and public life of the Romans. Intended to give a comprehensive view of the civilization of Rome. Study based on the monuments and literature. Lectures, supplemented by reading and reports. No knowledge of Latin required. A continuation of Greek *33*, the three terms together constituting the course called the History of Greek and Roman Life and Institutions. *Professor* GREENE.

Three hours. Second and third terms. Elective for Freshmen and Sophomores. Not offered in 1909–10.

30. *Roman Literature*

A brief history of Roman literature. Some of the most important and characteristic works studied in English translations. No knowledge of Latin required. Follows Greek 34 and is continued in the third term by Indo-European Philology 1. *Professor* HARKNESS.

Three hours. Second term. Elective for Freshmen and Sophomores. *Mon., Tu., Th., at 11.20.*

31, 32, 33. *History of the Roman Empire*

First term, the Early Empire. Second term, the Age of the Antonines. Third term, the Age of Constantine. *Professor* GREENE.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Each term may be elected independently. *Tu., Wed., Sat., at 9.20.*

XXI. ROMANCE LANGUAGES AND LITERATURES

COURTNEY LANGDON, A.B., *Professor of the Romance Languages and Literatures*

ALBERT BUSHNELL JOHNSON, A.M., *Associate Professor of the Romance Languages*

CHARLES HERMAN HUNKINS, A.B., *Instructor in French*

BENJAMIN LOUIS ANTOINE HÉNIN, B. ès L., LL.B., *Assistant in French*

1. *Elementary Course*

Grammar, composition, dictation, conversation; translation of selections from modern authors into idiomatic English. *Mr.* HUNKINS *and* ——.

Three hours. Through the year. Required of all students who did not present French for admission. *1st div. Tu., Th., Fri., at 8; 2d div. Tu., Wed., Sat., at 9.20; 3d div. Mon., Tu., Th., at 2.20.*

2, 3, 4. *Intermediate Course*

Reading of modern and classical authors. Review of grammar; composition and conversation based upon the texts read; dictation. *Professor* JOHNSON, *Messrs.* HUNKINS *and* ——.

Three hours. Through the year. Required of all students who presented elementary French for admission. Elective for students who have credit for 1. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Fri., at 8; 3d div. Tu., Fri., Sat., at 10.20; 4th div. Tu., Th., Fri., at 3.20; 5th div. Mon., Th., Fri., at 9.20.*

5, 6, 7. *French Language and Literature*

An introduction to classical and modern French literature; composition; conversation based on the texts read; dictation. *Mr.* HUNKINS.

Three hours. Through the year. Elective for students who presented advanced French for admission. *Mon., Tu., Th., at 11.20.*

8, 9, 10. *French Literature, exclusive of the Drama, from 1800 to 1850*

Chateaubriand, Hugo, Lamartine, De Musset, De Vigny, Balzac, George Sand, and Gautier; abstracts, in French, of works read outside the class; sight reading a prominent feature. *Professor* JOHNSON.

Three hours. Through the year. Elective for students who have credit for 2, 3, 4 or 5, 6, 7. *Mon., Tu., Th., at 11.20.*

[11, 12, 13. *French Literature, exclusive of the Drama, since 1850*]

Flaubert, the Goncourts, Daudet, Zola, Taine, Loti, and others; abstracts, in French, of works read outside the class; sight reading a prominent feature. *Professor* JOHNSON.

Three hours. Through the year. Elective for students who have credit for 2, 3, 4 or 5, 6, 7. Not offered in 1909–10.

14. *Composition*

Practice in writing French. Most appropriately taken in connection with 5, 6, 7; 8, 9, 10; or 11, 12, 13. *Mr.* HÉNIN.

One hour. Through the year. Elective for students who have taken 2, 3, 4, or are taking 5, 6, 7. *Fri. at 2.20.*

[17, 18, 19. *Old French*]

The elements of Romance philology and an introduction to the literature of the Middle Ages in France.

Three hours. One session weekly. Through the year. Elective for approved Seniors and Graduates. Not offered in 1909–10.

[20, 21, 22. *French Literature, exclusive of the Drama, from 1600 to 1800*]

Pascal, Madame de La Fayette, La Fontaine, Boileau, Bossuet, Madame de Sévigné, Saint-Simon, Le Sage, Voltaire, Rousseau. *Professor* JOHNSON.

Three hours. Through the year. Elective for students who have credit for 10 or 13. Not offered in 1909–10.

23, 24, 25. *The French Drama*

A course covering the history of the French drama. The classical school from Corneille to Beaumarchais and the romantic and realistic schools from Hugo to Rostand. Lectures in French. *Professor* LANGDON.

Three hours. Through the year. Elective for students who have credit for 7, 10, or 13. *Tu., Fri., Sat., at 10.20.*

[50. *Molière in English*]

A study of Molière's plays, by means of English translations, in the light of the French civilization of the seventeenth century. *Professor* LANGDON.

Three hours. First term. Elective for Sophomores and Juniors who also elect German 50 and English 50. Not offered in 1909–10.

26, 27, 28. *Modern Italian*

Grammar, composition, conversation, and rapid translation of modern authors. *Professor* LANGDON.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern foreign language. *Mon., Th., Fri., at 9.20.*

[29, 30, 31. *Italian Literature from 1321 to 1800*]

Selections from Petrarch, Sacchetti, Tasso, Macchiavelli, and Goldoni, with a brief survey of the life and history of the times. *Professor* LANGDON.

Three hours. Through the year. Elective for students who have credit for 26, 27, 28. Not offered in 1909–10.

[32, 33, 34. *Classical Italian*]

Selections from Dante, Petrarch, Ariosto, and Tasso. *Professor* LANGDON.

Three hours. Through the year. Elective for students who have credit for 26, 27, 28. Not offered in 1909–10.

35, 36, 37. *Dante in English*

A study of the whole of the *Divina Commedia* in English, in the light of modern thought and in connection with other great world-poems. An introduction to a study of comparative literature by means of the best available translations. *Professor* LANGDON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

38, 39, 40. *Modern Spanish*

Grammar, conversation, composition, writing from dictation, and rapid reading. *Professor* JOHNSON.

Three hours. Through the year. Elective for Juniors, and for Sophomores not electing more than one other modern foreign language. *Tu., Fri., Sat., at 10.20.*

41, 42, 43. *Spanish Language and Literature*

Selected works of classical and modern authors; composition; conversation. *Professor* JOHNSON.

Three hours. Through the year. Elective for students who have credit for 38, 39, 40. *Mon., Wed., Th., at 10.20.*

XXII. SOCIAL AND POLITICAL SCIENCE‡

GEORGE GRAFTON WILSON, PH.D., *Professor of Social and Political Science*

JAMES QUAYLE DEALEY, PH.D., *Professor of Social and Political Science*

LESTER FRANK WARD, A.M., LL.D., *Professor of Sociology*

CAROL ARONOVICI, B.S.A., B.L., *Assistant in Social Science*

POLITICAL SCIENCE

1. *Political Science, elementary*

Affords a general outline of the subject, and serves as an introduction to the more extended and special courses which follow. *Professor* WILSON.

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‡ The courses in this department other than 1 are open only to those students who have credit for Political Science 1, Economics 1, and Social Science 1, which together constitute an introduction to the advanced work of the departments of Social and Political Science and Economics.

Three hours. First term. Sophomore, Junior, or Senior year. Required of candidates for the degree of Bachelor of Arts; elective for others. Followed by Economics 1. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Mon., Wed., Fri., at 12.20.*

2. *International Relations*

International law, diplomacy, and world-politics. *Professor* WILSON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

3, 4. *American Government* ‡

First term, constitution, organization, powers, and methods of the national system of government. Second term, organization and functions of the states and cities of the United States. Followed by 5 in the third term. *Professor* DEALEY.

Three hours. First and second terms. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

5. *Comparative Study of Constitutions* ‡

The constitutions of Germany, France, Great Britain, and Switzerland especially considered. *Professor* DEALEY.

Three hours. Third term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

13. *The State* §

The origin, forms, development, functions, and institutions of the state. *Professor* DEALEY.

Three hours. First term. Followed in the second term by 8. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.20.*

8. *Constitutional Law* §

The principles and development of constitutional law, with special reference to the Constitution of the United States. *Professor* DEALEY.

Three hours. Second term. Followed in the third term by 7. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.20.*

7. *Jurisprudence* §

The fundamental principles of law and legal relations. *Professor* WILSON.

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‡ Courses 3, 4, 5, form a single course continuous through the year.

§ Courses 13, 8, 7, form a single course continuous through the year.

Three hours. Third term. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.20.*

6. *Roman Law*‡

The influence of Roman law on ancient and modern political institutions. *Professor* WILSON.

Three hours. One term. Offered if applied for by Graduates.

9. *The Latin-American Republics*‡

The government and social conditions of the Latin-American Republics. *Professor* DEALEY.

Three hours. One term. Offered if applied for by Graduates.

10. *Political Parties*‡

The development of political parties in the United States and Europe. *Professor* WILSON.

Three hours. One term. Offered if applied for by Graduates.

11. *Administration*‡

The principles and the chief national systems of administration. *Professor* WILSON.

Three hours. One term. Offered if applied for by Graduates.

12. *Administration (continued)*‡

Local and colonial administration. *Professor* WILSON.

Three hours. One term. Offered if applied for by Graduates.

14. *Development of Political Theory*‡

The growth of important political ideas traced from Plato to the present time, with emphasis on the evolution of democracy. *Professor* DEALEY.

Three hours. One term. Offered if applied for by Graduates.

15. *Current Political Theory and Practice*‡

A seminary course. Intended to train students in methods of estimating the value and significance of recent publications on political topics, and the changes consequent upon current political development. *Professors* WILSON *and* DEALEY.

One hour. Through the year. Elective for Graduates. *Mon. at 4.30.*

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‡ Courses 6, 9–12, 14, 15, are primarily for Graduates, and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

20, 21, 22. *Investigation of Special Topics*

Intended to train the student in methods of gathering, handling, and presenting data in the study of political problems. In connection with this course, work in comparative legislation may be taken under the direction of the Legislative Reference Bureau of the State Library. Laboratory methods. *Professors* WILSON, DEALEY, *and* KIRK.

Three hours. Six hours of attendance. Through the year. Elective for Graduates and for approved Juniors and Seniors.

SOCIAL SCIENCE

1. *Social Science, elementary*

Affords a general outline of the subject, and serves as an introduction to the more extended and special courses which follow. *Professor* DEALEY.

Three hours. Third term. Sophomore, Junior, or Senior year. Must be preceded by Economics 1 and Political Science 1. Required of candidates for the degree of Bachelor of Arts; elective for others. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Mon., Wed., Fri., at 12.20.*

2. *Social Institutions, Conditions, and Problems*

Historical development of domestic, religious, and political institutions; study of such social problems as charity, crime, intemperance, marriage and divorce, etc. First term, *Professor* DEALEY. Second and third terms, *Professor* WILSON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

3. *Origin and Development of Society* ‡

The formation of human institutions and their subsequent modifications. *Professor* WARD.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

4. *Social Philosophy* ‡

The relation of sociology to other sciences, especially its psychic aspects, and the interpretation of social phenomena. *Professor* WARD.

Three hours. First and second terms. Followed in third term by Social Science 5. Elective for Seniors and Graduates. *Wed., Fri., Sat., at 11.20.*

‡ Course 3 deals with the subject chiefly from the historical standpoint. Course 4 deals mainly with the principles and theory of sociology. Undergraduates should not elect both of these courses in the same year, and 3 should precede 4. Course 5 may properly follow either of these.

5. *Application of Sociological Principles*‡

The utility of sociology as the basis of legislation and of the social art. The improvement of society through conscious effort. *Professor* WARD.

Three hours. Third term. Elective for Seniors and Graduates. *Wed., Fri., Sat., at 11.20.*

6. *Sociological Aspects of Education*§

The social importance of intellectual development and of the diffusion of knowledge. *Professor* WARD.

Three hours. Through the year at 4.30. Days to be arranged with class. Elective for Graduates. Alternates with 10.

7. *Current Social Theory and Practice*§

A seminary course. (*See* Political Science 15.) *Professors* WILSON *and* DEALEY.

One hour. Through the year. Elective for Graduates. *Mon. at 5.30.*

8. *Demography*§

Dispersion of races; social study of race characteristics; emigration, immigration, etc. *Professor* WILSON.

Three hours. One term. Offered if applied for by Graduates.

9. *Development of Social Theory*§

Traces important theories, ancient and modern, in regard to social conditions and development. *Professor* DEALEY.

Three hours. One term. Offered if applied for by Graduates.

[10. *Sociological Theories of the Nineteenth Century and their Significance*]§

A review of modern sociological thought in Europe and America, and its influence on the life and institutions of society. *Professor* WARD.

Three hours. Through the year. Elective for Graduates. Alternates with 6. Not offered in 1909–10.

20, 21, 22. *Investigation of Special Topics*

Intended to train the student in methods of gathering, handling, and presenting data in the study of social problems. During the year 1909–10 a special investigation course on Municipal Conditions and Social Welfare, including a study of social statistics, is given by Carol Aronovici, Head of the Union Settlement. Laboratory methods. Under the direction of *Professors* Wilson *and* Kirk.

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‡ Course 3 deals with the subject chiefly from the historical standpoint. Course 4 deals mainly with the principles and theory of sociology. Undergraduates should not elect both of these courses in the same year, and 3 should precede 4. Course 5 may properly follow either of these.

§ Courses 6–10 are primarily for Graduates, and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

Three hours. Six hours of attendance. Through the year. Elective for Graduates and for not more than twelve Juniors and Seniors approved by the department.

MUSIC

Arthur Ware Locke, A.B., *Instructor in Music*

1, 2, 3. *The Evolution of Modern Music*

A general course, taking up modern composers and their works from Haydn to Wagner and Richard Strauss. Lectures, illustrations on the piano, assigned readings, and papers. Designed to give power of appreciation and interpretation with the minimum of technical detail.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. No previous knowledge of music required. *Mon., Wed., Th., at 10.20.*

PHYSICAL TRAINING

Frederick William Marvel, Ph.B., *Professor of Physical Training*

From the close of the Thanksgiving recess to the end of the second term, all first and second year students are required to attend gymnasium exercises three times a week as follows:

Freshmen. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Mon., Tu., Th., at 4.20.*

Sophomores. *1st div. Mon., Wed., Th., at 10.20; 2d div. Tu., Th., Fri., at 3.20.*

A voluntary class for Juniors and Seniors will be held on *Mon., Tu., Th., Fri., at 5.10.* Classes in heavy gymnastics, under the direction of a special instructor, are held four afternoons a week. Classes in wrestling, under the direction of a special instructor, are held two afternoons a week. Instruction in swimming, under the direction of a special instructor, is given by appointment.

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VII JUNE, 1910 NO. 3

BULLETIN
OF
BROWN UNIVERSITY

ANNOUNCEMENT OF COURSES
1910-1911

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UNIVERSITY OF ILLINOIS

WOMEN'S COLLEGE EDITION

PROVIDENCE
PUBLISHED BY THE UNIVERSITY
[APRIL, MAY, JUNE, OCTOBER, DECEMBER]

red as second-class matter April 1, 1905, at the Post Office at Providence, R. I., under Act of Congress of July 16, 1894

ANNOUNCEMENT OF COURSES
OFFERED AT
THE WOMEN'S COLLEGE
IN
BROWN UNIVERSITY
1910-1911

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PROVIDENCE, RHODE ISLAND
PUBLISHED BY THE UNIVERSITY
1910

GENERAL ANNOUNCEMENTS
FOR
THE ACADEMIC YEAR
1910–11

⁂

THE Academic Year begins with chapel service in Pembroke Hall, at 9 a.m., on Wednesday, September 28.

For information regarding Entrance Examinations, Registration and Enrolment of Undergraduates and Graduates, and Requirements for the various Degrees, see pages 6 to 15 of this Announcement. The following special announcements relate to the Women's College. Undergraduates must register at the Registrar's Office, in Pembroke Hall, between 9 a.m. and 12 m., or between 2 p.m. and 4 p.m., on September 26 and 27. Undergraduates in residence must return their Registration cards to the Register not later than June 4. Graduate students register at the office of the Registrar of the University.

COURSES OF INSTRUCTION

WITH the exception of Biology 20 and 22, Greek Literature and History 36, and Roman Literature and History 5 and 34, courses of instruction are identical with corresponding courses offered to men. Detailed information may be found on pages 18–88. The officers of instruction are those conducting courses for men also, with the addition of:

LIDA SHAW KING, A.M., *Professor of Classical Literature and Archaeology*

ALICE WILSON WILCOX, A.M., *Instructor in Biology*

*Courses designated by a † are given at the University; women are admitted to them, but only on the recommendation of the Dean of the Women's College. Women may also be admitted to other University courses not announced here, with the special permission of the department and with the consent of the Dean of the Women's College. In courses designated by a * a final mark covering the work of the course as a whole is given at the end of the course, the marks given at the end of the preceding term or term* *being regarded as temporary. Graduate courses are not included in this list, although approved Seniors are admitted to many of them. For Graduate courses, see pages 18–88.*

ART

1, 2, 3. *History of Art from Antiquity through the Renaissance*

Professor Poland.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Each term may be elected independently. *Tu., Wed., Sat., at 9.25.*

[4, 5. *Modern Art*]

Not offered in 1910–11.

[6. *Theory and Criticism of the Fine Arts*]

Not offered in 1910–11.

10. *Freehand Drawing*

One hour. Two hours of drawing. Through the year. Elective for all students. Given at the Rhode Island School of Design. *Tu., or Th., or Fri., at 2.20.*

11. *Practical Work in Art*

Three hours. Through the year. Elective for students who have credit for 10, and who have taken or are taking 1, 2, 3. Given at the Rhode Island School of Design. *Tu., Th., Fri., at 2.20.*

13. *Architectural Design*

Three hours. One hour of recitation and four hours of drawings. Through the year. Elective for students who have credit for Art 10 and Mechanical Drawing 1. Given at the Rhode Island School of Design by Mr. Huger Elliott, Director. *Th. at 3.20.*

ASTRONOMY

1, 2, 3, *General Course*

Mr. ——.

Three hours. Through the year. Elective for Juniors and Seniors who have credit for Mathematics 3, 1, 2. *Wed., Fri., Sat., at 11.25.* Observations at Ladd Observatory.

13, 14, 15.† *Advanced Astronomy*

Three hours. Through the year. Elective for Graduates and approved Undergraduates.

BIBLICAL LITERATURE AND HISTORY

1.† *Elementary Hebrew*

Professor Fowler *and Dr.* Stern.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

[7, 8, 9.† *Gospels and Epistles*]

Not offered in 1910–11.

10, 11, 12.† *Acts and Pauline Epistles*

Professor Fowler. Third term, *Professor* Paine.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently.

[14, 19, 20. *New Testament Literature and History*]

Not offered in 1910–11.

21, 22, 23. *The English Bible as Literature*

Professor Fowler.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Each term may be elected independently. *Tu., Wed., Sat., at 9.25.*

15.*† *Biblical Seminary*

Professor Fowler.

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors.

BIOLOGY

2.† *Comparative Anatomy of Vertebrates*

Professor Walter.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for 1.

3.† *Bacteriology*

Professor Gorham.

Three hours. Six hours of attendance. Third term. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon., Wed., Th., at 10.20.*

4, 5.† *Advanced Histology and Pathology*

Professor Mead *and Dr.* Fulton.

Three hours. Six hours of attendance. First and second terms. Elective for Juniors, Seniors, and Graduates, who have credit for 1 and 10.

7.† *Chemical Physiology*

Dr. Mitchell.

Three hours. Six hours of attendance. First and second terms. Must be preceded by Chemistry 1, 2, 3, and should be preceded by Chemistry 10. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Tu., Fri., Sat., at 10.20.*

8.† *Physical Physiology*

Dr. Mitchell.

Three hours. Six hours of attendance. Third term. Must be preceded by 7. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Tu., Fri., Sat., at 10.20.*

9.† *Anatomy of the Nervous System*

Professor Mead.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1.

10.† *Embryology and Histology*

Professor Mead.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1.

12.† *Advanced Bacteriology*

Professor Gorham.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates, who have credit for 3. *Mon., Th., at 4.20.*

18. *Ornithology*

Professor Walter.

One hour. Two hours of attendance. Third term. Elective for Undergraduates.

19.† *Entomology*

Professor Gorham.

One hour. Two hours of attendance. First term. Elective for Undergraduates.

30.† *Protozoology*

Professors Gorham *and* Walter.

One hour. Two hours of attendance. Second term. Elective for Undergraduates.

33.† *Clinical Analysis*

Dr. Mitchell.

Three hours. Six hours of attendance. Third term. Must be preceded by 7. Elective for Juniors, Seniors, and Graduates, and for Sophomores who are not taking any other course in the department.

[34.† *Comparative Anatomy of Invertebrates*]

Not offered in 1910–11.

20. *Euthenics*

Aims to teach the scientific facts and physiological and economic principles upon which *right living* depends. First term: the chemistry of foods and their physiological and economic value; food constituents, proteids, carbohydrates, fats, etc.; digestion and absorption; quantitative analysis of milk; selection and preparation of food; study of dietaries. Second term: the principles of general physiology and their application to personal hygiene; circulation, respiration, excretion, and reproduction; muscular and nervous action under varying conditions of stimulation, temperature, fatigue, etc. Third term: the principles of construction and practical management of the home necessary for the economy, health, and social efficiency of the individual occupants; demonstration of sanitary methods. Those who desire may substitute the first term's work in General Biology (22) for that of Euthenics (20). *Miss* Wilcox, *assisted by Miss* Hickson.

Three hours. Six hours of attendance. Through the year. Elective for all Undergraduates. *Mon., Wed., Th., 10.25 to 12.15.*

22. *General Biology*

Introductory to other courses in the department; also designed for those who, without intending to pursue the subjects further, desire a general view of biological work and biological theories, as variation, natural selection, evolution, and heredity. First term: practice in dissection; study of the structure and functions of the different organs of a typical mammal and comparisons with those of man. Second and third terms: use of compound microscope, study of the cell, protoplasm, tissues; metabolism, growth and reproduction in unicellular animals and plants; theories of fermentation, infection, vaccination, and immunity; more specialized forms, hydra, fern, annelid, lobster, and frog. Collecting trips in the spring. Those who desire may substitute the second and third terms of Euthenics (20) for those of General Biology (22). The classes in Botany (1) and General Biology (22) are combined the second and third terms. *Miss* Wilcox, *assisted by Miss* Hickson.

Three hours. Six hours of attendance. Through the year. Elective for undergraduates. *Tu., Wed., Sat., 9.25 to 11.15.*

BOTANY

1. *Introductory Course*

Professor Collins.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. *Tu., Wed., Sat., at 9.25.*

3, 4, 5.† *Comparative Morphology*

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for 1, and for approved graduates. *Mon., Wed., Fri., at 12.20.*

6.*† *Special Course*

One to three hours. Two to six hours of attendance. Through the year. Elective for Graduates and for approved Juniors and Seniors. Graduates may, with the consent of the instructor, elect the course for more than three hours.

7.† *Trees*

One hour. Two hours of attendance. Third term. Elective for Undergraduates. Lectures, *Wed. at 8.*

CHEMISTRY

1, 2, 3. *Descriptive Chemistry*

Professor Bucher *and Mr.* Holt.

Three hours. Through the year. Elective for Undergraduates. *Tu., Th., Sat., at 12.25.*

4, 5.† *Qualitative Analysis*

Professor Appleton *and Mr.* Crossley.

Three hours. Six hours of attendance. First and second terms. Elective for Juniors who have credit for 1, 2, 3. *1st div. Fri. at 11.20; 2d div. Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

6.† *Quantitative Analysis*

Professor Appleton *and Mr.* Crossley.

Three hours. Six hours of attendance. Third term. Elective for Juniors who have credit for 4, 5. *1st div. Fri. at 11.20; 2d div. Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

7, 8, 9.† *Quantitative Analysis, Advanced Course*

Professor Appleton *and Mr.* Crossley.

Six hours. Twelve hours of attendance. Through the year. Elective for Seniors and Graduates who have credit for 6. Laboratory hours to be arranged with the instructor.

10, 11, 12.† *Organic Chemistry*

Professor Bucher *and Mr.* Weed.

Six hours. Through the year. First and second terms, three lectures a week and three laboratory periods a week. Elective for approved Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

13.† *Assaying*

Professor Appleton *and Mr.* Crossley.

Six hours. Twelve hours of attendance. Third term. Elective for Seniors and Graduates who have credit for 1–6.

14.† *Organic Dyes*

Professor Appleton *and Mr.* Crossley.

Six hours. Twelve hours of attendance. Third term. Elective for approved Seniors and Graduates.

[18, 19, 20.† *Physical Chemistry*]

Not offered in 1910–11.

23.† *Inorganic Chemistry, Advanced Course*

Professor Bucher.

Three hours. Third term. Elective for approved Juniors, Seniors, and Graduates.

24, 25, 26.† *Organic Preparations, Advanced Course*

Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

27, 28, 29.† *Inorganic Preparations, Advanced Course*

Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates, who have credit for 10, 11, 12.

33, 34, 35.† *Conference on Special Topics in Chemistry*
Professor BUCHER.

One hour. Through the year. Elective for approved students.

36, 37, 38.† *Conference on Special Topics in Chemistry*
Professor APPLETON.

One hour. Through the year. Elective for approved students.

ECONOMICS

1. *Elementary Economics*
Professor KIRK.

Three hours. First term. Sophomore, Junior, or Senior year. Required of candidates for the degree of Bachelor of Arts; elective for other students. *Tu., Th., Sat., at 12.25.*

[3.† *Money and Banking*]
Not offered in 1910–11.

4.† *Public Finance*
Professor GARDNER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

5.† *History and Present Tendencies of Economics*
Professors GARDNER *and* KIRK.

Three hours. One session of an hour and a half weekly. Through the year. Elective for Seniors and Graduates who have credit for 2. Hours to be arranged with the instructor.

12, 6, 7. *Industrial Life, The Labor Movement, Socialism*
Three hours. Through the year. *Mon., Th., Fri., at 9.25.*

9.† *The Tariff*
Professor KIRK.

Three hours. Third term. Elective for Juniors, Seniors, and Graduates. Not to be offered in 1911–12.

[10, 11, 12.† *Industrial History*]
Not offered in 1910–11.

13.† *Economic and Commercial Geography*

Professors Brown *and* Kirk.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Wed., Th., at 10.20.* Conference hours to be arranged with the instructors.

20, 21, 22.† *Investigation of Special Topics*

Professors Gardner *and* Kirk.

Three hours. Six hours of attendance. Through the year. Elective for approved Juniors, Seniors, and Graduates. Each term may be elected independently.

EDUCATION

1. *History of Education*

Professor Jacobs.

Three hours. First term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.25.*

2. *Critical Study of Modern Education*

Professor Jacobs.

Three hours. Second term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.25.*

3. *Fundamental Principles of Education*

Professor Jacobs.

Three hours. Third term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.25.*

4. *Psychology of Education*

Professor Jacobs.

Three hours. First term. Elective for Seniors and Graduates who have credit for 1, 2, or 3, or who are taking 1. *Mon., Th., Fri., at 9.25.*

5. *Hygiene of Education*

Professor Jones.

Three hours. Second term. Elective for Seniors and Graduates who have credit for 1, 2, or 3, or who are taking 2. *Mon., Th., Fri., at 9.25.*

6. *Practical Introduction to Teaching*

Three hours. Third term. Elective for Seniors and Graduates who have taken or are taking other courses in Education. *Mon., Th., Fri., at 9.25.*

ENGLISH

1. *Rhetoric and Composition*

Messrs. Hastings, Harkness, *and* Grose.

Three hours. Through the year. Required of all Freshmen. *Wed., Fri., Sat., at 11.25.*

[3.* *English Composition, Advanced Course*]

Not offered in 1910–11.

4.* *Argumentative Composition*

Professor Huntington.

Three hours. Through the year. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.25.*

7. *Public Speaking*

Professor Crosby.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Fri., Sat., at 10.25.*

9.† *Old English*

Professor Potter.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th.. Fri., at 4.20.*

10.† *Chaucer*

Professor Benedict.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 3.20.*

11. *English Literature from the Beginning to the Present Time*

Professor Bronson.

Three hours. Through the year. Elective for Sophomores. *Wed., Fri., Sat., at 11.25.*

13. *History of the Drama in England*

Professor Potter.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. *Mon., Tu., Th., at 11.25.*

[18. *The Modern English Drama*]

Not offered in 1910–11.

[14. *Shakspere*]

Not offered in 1910–11.

[15. *Shakspere*]

Not offered in 1910–11.

16.† *English Literature exclusive of the Drama, from 1600 to 1660*

Professor Bronson.

Three hours. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. *Mon., Wed., Fri., at 12.20.* Not to be offered in 1911–12.

17. *English Literature from 1660 to 1798*

Professor Damon.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. *Mon., Tu., Th., at 2.25.*

19. *English Literature from 1798 to 1832*

Professor Benedict.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Fri., Sat., at 10.25.*

[20. *English Literature from 1832 to 1892*]

Not offered in 1910–11.

[22. *American Literature*]

Not offered in 1910–11.

23.† *Seminary in English Literature*

Professor Bronson.

Three hours. Two hours of attendance. Through the year. Elective for Graduates, and for a limited number of Seniors who have attained the grade of C in two of the courses from 9 to 22 inclusive.

GEOLOGY

3.† *General Geology*

Professor Brown, *Messrs.* Dale *and* Martin.

Three hours. Through the year. Elective for Undergraduates, except Sophomores who elect 1. *Tu., Fri., Sat., at 10.20.*

[6.† *Dynamical and Structural Geology*]

Not offered in 1910–11.

12.† *Economic and Commercial Geography*

Professors Brown *and* Kirk.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Wed., Th., at 10.20.* Conference hours to be arranged with the instructors.

13.† *Geographic Seminary*

Three hours. One hour of attendance. Through the year. By special arrangement with the instructor, the course may be taken for a shorter period. Elective for Graduates, and for Undergraduates who have passed the first term's work in course 12, or an equivalent. *Sat. at 11.20.*

GERMANIC LANGUAGES AND LITERATURES

1. *Introductory Course*

Mr. Bachmann.

Three years. Through the year. Required of all students who did not present German for admission. *Mon., Wed., Fri., at 12.25.*

2. *Intermediate Course*

Mr. ——.

Three hours. Through the year. Required of all Freshmen who presented elementary German for admission. Not elective for students who have taken German in college. *Mon., Wed., Fri., at 12.25.*

3, 4, 5. *Reading Course*

Professor Crowell.

Three hours. Through the year. Elective for students who have credit for 1. *Mon., Tu., Th., at 11.25.*

6.† *Modern Prose*

Professor von Klenze *and Mr.* Bachmann.

Three hours. Through the year. Elective for students who have credit for 1 or 2, or 3, 4, 5, who presented advanced German for admission. *Tu., Fri., Sat., at 10.20.*

7. *Advanced Course in Standard Authors, Classical and Modern*

Mr. Mitchell.

Three hours. Through the year. Elective for students who have credit for 2, and for students who presented advanced German for admission. *Mon., Wed., Fri., at 12.25.*

[23, 24, 25.† *German Lyrical Poetry*]
Not offered in 1910–11.

29, 30, 31. *The German Drama of the Nineteenth Century*
Professor von Klenze.

Three hours. Through the year. Elective for students who have credit for 5, 6, or 7. Each term may be elected independently. *Tu., Wed., Sat., at 9.25.*

32.† *Lessing and Schiller*
Professor Crowell.

Three hours. Through the year. Elective for students who have credit for 5, 6, or 7. *Mon., Th., Fri., at 9.20.*

[10. *Goethe's Faust: Parts 1 and 2*]
Not offered in 1910–11.

[33, 34, 35.† *Goethe: A Study of His Life and Works*]
Not offered in 1910–11.

[12, 13, 14.† *Outline History of German Literature*]
Not offered in 1910–11.

37, 38, 39.† *German Literature in the Nineteenth Century*
Professor von Klenze.

Three hours. Through the year. Elective for students who have credit for 7, 10, 28, or 31. *Tu., Th., Sat., at 12.20.*

[17.† *Germanic Mythology*]
Not offered in 1910–11.

[20.† *Old Norse*]
Not offered in 1910–11.

[15.† *Middle High German*]
Not offered in 1910–11.

36.† *Seminary in German Literature*
Professor von Klenze.

Elective for approved students.

GREEK LITERATURE AND HISTORY

A, B, C. *Elementary Course*

Three hours. Through the year. Elective for students who did not present elementary and advanced Greek for admission. *Mon., Wed., Fri., at 12.25.*

3. *Lysias*

Professor Paine.

Three hours. First term. Elective for students who presented elementary and advanced Greek for admission, or who have credit for Greek A, B, C, and have done the additional work indicated above. *Tu., Fri., Sat., at 10.25.*

1. *Plato*

Professor Paine.

Three hours. Second term. Elective for students who have credit for 3. *Tu., Fri., Sat, at 10.25.*

2. *Homer*

Professor Manatt.

Three hours. Third term. Elective for students who have credit for 1. *Tu., Fri., Sat., at 10.25.*

35. *Greek Historians*

Professor Manatt.

Three hours. First term. Elective for Sophomores. *Tu., Fri., Sat., at 10.25.*

4. *Lucian*

Professor Paine.

Three hours. Second term. Elective for Sophomores. *Tu., Fri., Sat., at 10.25.*

6. *Dramatic Poets*

Professor Manatt *or Professor* Paine.

Three hours. Third term. Elective for Sophomores. *Tu., Fri., Sat., at 10.25.*

[8. *Homer*]

Not offered in 1910–11.

[7. *Plato and Aeschylus*]

Not offered in 1910–11.

[9. *Theocritus and Herondas*]

Not offered in 1910–11.

[10. *The Drama*]

Not offered in 1910–11.

11. *Herodotus*

Professor Manatt.

Three hours. First term. Elective for Juniors and Seniors. *Mon., Tu., Th., at 11.25.*

12. *Thucydides*

Professor Manatt *or Professor* Paine.

Three hours. Second term. Elective for Juniors and Seniors. *Mon., Tu., Th., at 11.25.*

[13. *Lucian*]

Not offered in 1910–11.

[14. *Aeschines and Demosthenes*]

Not offered in 1910–11.

15. *Pindar and Bacchylides*

Professor Manatt.

Three hours. Third term. Elective for Juniors and Seniors. *Mon., Tu., Th., at 11.25.*

23, 24, 25.† *Greek Seminary*

Professors Manatt *and* Paine.

One two-hour session weekly. Through the year. Elective for Graduates and approved Seniors.

33. *Greek Life*

Professors Manatt *and* Paine.

Three hours. First term. Elective for Freshmen and Sophomores. *Tu., Wed., Sat., at 9.25.*

[34. *Greek Literature*]

Not offered in 1910–11.

36. *Introduction to Greek Archaeology*

Outline of the remains of the earliest Greek civilization; an introductory study of Greek vases, coins, small bronzes, and terra-cotta figurines. Intended to give a general survey of these sources for Greek history and life. Illustrated lectures; collateral reading. *Professor* King.

Three hours. Third term. Elective for students who have completed one course in Latin or Greek. *Mon., Th., Fri., at 9.25.*

HISTORY

1. *Medieval and Modern History of Europe*
Professor MacDonald.

Three hours. Through the year. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy in either the Sophomore or the Junior year. *Mon., Tu., Th., at 11.25.*

[2. *Spanish History*]
Not offered in 1910–11.

[3. *Islam and the Crusades*]
Not offered in 1910–11.

[4. *Period of the Renaissance*]
Not offered in 1910–11.

[5. *Period of the Reformation*]
Not offered in 1910–11.

[6. *The French Revolution*]
Not offered in 1910–11.

[7. *European History since 1815*]
Not offered in 1910–11.

[8, 9, 10. *English Constitutional and Political History to 1689*]
Not offered in 1910–11.

11, 12, 13. *English Constitutional and Political History since 1689*
Professor Munro.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Tu., Th., at 11.25.*

[19, 20, 21. *Constitutional and Political History of the United States*]
Not offered in 1910–11.

22, 23, 24.† *Seminary in American History*
Professor MacDonald.

Three hours. One to two hours of attendance. Through the year. Elective for Graduates and approved Seniors. The course should be preceded by 27, 28, 29, or 19, 20, 21, but by special permission it may be taken by students who have credit for 27, 28, 29, and are taking 19, 20, 21.

27, 28, 29. *American History*

Professor MACDONALD.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.25.*

INDO-EUROPEAN PHILOLOGY

[1. *General Introduction to the Study of Language*]

Not offered in 1910–11.

MATHEMATICS

3. *Algebra*

Professors MANNING *and* RICHARDSON.

Four hours. First term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Mon., Tu., Th., Fri., at 2.25.*

1. *Solid and Spherical Geometry*

Professors MANNING *and* RICHARDSON.

Four hours. Second term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Mon., Tu., Th., Fri., at 2.25.*

2. *Trigonometry*

Professors MANNING *and* RICHARDSON.

Four hours. Third term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Mon., Tu., Th., Fri., at 2.25.*

4. *Analytic Geometry*

Professor DAVIS.

Three hours. First and second terms. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. Elective for students who have credit for 3, 1, 2. *Mon., Wed., Th., at 10.25.*

5. *Differential and Integral Calculus*

Professor Davis.

Three hours. Third term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. Elective for students who have credit for 4. *Mon., Wed., Th., at 10.25.*

6, 7, 8.† *Differential and Integral Calculus*

Professors Davis *and* Richardson.

Three hours. Through the year. Elective for students who have credit for 5. *Tu., Th., Sat., at 12.20.*

9, 10, 11.† *Differential Equations*

Professor Manning.

Three hours. Through the year. Elective for students who have credit for 6 or 21. First term required of candidates for the degree of Bachelor of Science in Electrical Engineering. *Tu., Th., Sat., at 12.20.*

21.† *Integral Calculus*

Professors Davis *and* Richardson.

Three hours. Second and third terms. Required of candidates for the degree of Bachelor of Science. *One division, Tu., Wed., Sat., at 9.20. One division, Tu., Fri., Sat., at 10.20.*

[22.† *Function Theory of a Complex Variable*]

Not offered in 1910–11.

[24.† *Advanced Algebra*]

Not offered in 1910–11.

27.† *Projective Geometry*

Dr. Archibald.

Three hours. Through the year. Elective for Graduates and approved Seniors.

28.† *Function Theory of a Real Variable*

Professor Richardson.

Three hours. Through the year. Elective by special permission of instructor.

PHILOSOPHY

1. *Logic*

Professor Meiklejohn *and Mr.* Pope.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon., Tu., Th., at 11.25.*

2. *Psychology, Introductory Course*

Professor DELABARRE.

Three hours. Through the year. Elective for Juniors and Seniors. *Tu., Th., Sat., at 12.25.*

3.† *Psychology, Advanced Course*

Professor DELABARRE.

Three hours. Through the year. Elective for Undergraduates and Graduates who have taken 2, or its equivalent.

4.† *Experimental Psychology, Introductory Laboratory Course*

Professor DELABARRE.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates, who have taken or are taking 2. Although essentially a year course, it may, by special arrangement with the instructor, be taken for a shorter period.

5.† *Experimental Psychology, Advanced Laboratory Course*

Professor DELABARRE.

One to six hours. Two to twelve hours of attendance. Through the year. Elective for students who have credit for 4. May be taken for more than six hours by Graduates.

[6, 7, 8. *History of Philosophy*]

Not offered in 1910–11.

9, 10. *Theoretical Ethics*

Professor EVERETT.

Three hours. First and second terms. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.25.*

12. *Philosophy of Religion*

Professor EVERETT.

Three hours. Third term. Elective for Seniors and Graduates who have credit for one course in Philosophy. *Mon., Wed., Th., at 10.25.*

[16.† *Kantian and Post-Kantian Philosophy*]

Not offered in 1910–11.

17.† *Metaphysics*

Professor Meiklejohn.

Three hours. Through the year. Elective for students who have credit for 6, 7, 8, and for Graduates.

PHYSICS

1, 2, 3. *Elementary Physics*

Professor Barus.

Three hours. Through the year. Elective for Undergraduates who have credit for Mathematics 1, 2, 3. *Mon., Tu., Th., at 11.25.*

4, 5, 6.† *Elementary Physics, continued*

Professor Barus.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for 1, 2, 3. *Tu., Fri., Sat., at 10.20.*

7.† *Physical Measurements*

Professor Palmer *and Mr.* Field.

Three hours. Six hours in the laboratory. Through the year. Elective for students who have credit for 1, 2, 3, or 4, 5, 6.

14, 15, 16.† *Advanced Laboratory Course*

Professors Barus, Palmer, *and* Watson.

Three or six hours. Six or twelve hours of attendance. Through the year. Elective for students who have credit for 7.

17, 18, 19.† *Applied Harmonic Analysis and Applied Vector Analysis*

Professor Barus.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 1, 2, 3, and Mathematics 6, 7, 8.

20, 21, 22.† *Physics, Advanced Course*

Professor Barus.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for Mathematics 6, 7, 8.

ROMAN LITERATURE AND HISTORY

1. *Livy*

Professor King.

Three hours. First term. Elective for students who presented elementary and advanced Latin for admission. *Mon., Th., Fri., at 9.25.*

2. *Cicero's Letters*

Professor Greene.

Three hours. Second term. Elective for students who presented elementary and advanced Latin for admission. *Mon., Th., Fri., at 9.25.*

3. *Tacitus' Germania and Agricola*

Professor Greene.

Three hours. Third term. Elective for students who presented elementary and advanced Latin for admission. *Mon., Th., Fri., at 9.25.*

4. *Horace's Odes and Epodes*

Professor Greene.

Three hours. First term. Elective for Sophomores. *Mon., Th., Fri., at 9.25.*

[5. *Catullus, Tibullus, and Propertius*]

Not offered in 1910–11.

[34. *Vergil*]

Bucolics, with special reference to literary sources and influence; *Georgics* and *Aeneid,* with special reference to the history of the times. *Professor* King.

Three hours. Second term. Elective for Sophomores, *Mon., Th., Fri., at 9.25.*

6. *Horace's Satires*

Professor Greene.

Three hours. Third term. Elective for Sophomores. *Mon., Th., Fri., at 9.25.*

[7, 8, 9. *Latin Poetry*]

Not offered in 1910–11.

10, 11, 12. *Latin Prose*

Professors Harkness *and* Greene.

Three hours. Through the year. Elective for Juniors and Seniors. Each term may be elected independently. *Tu., Th., Sat., at 12.25.*

[22, 23, 24. *Latin Composition*]

Not offered in 1910–11.

28, 29. *Roman Life*

Professor Greene.

Three hours. Second and third terms. Elective for Freshmen and Sophomores. *Tu., Wed., Sat., at 9.25.*

[30. *Roman Literature*]
Not offered in 1910–11.

ROMANCE LANGUAGES AND LITERATURES

1. *Elementary Course. First year*
Mr. CHINARD.

Three hours. Through the year. Required of all students who did not present French for admission. *Mon., Wed., Th., at 10.25.*

2, 3, 4. *Intermediate Course*
Mr. HUNKINS.

Three hours. Through the year. Required of all students who presented elementary French for admission. Elective for students who have credit for 1. *Mon., Wed., Th., at 10.25.*

5, 6, 7. *French Language and Literature*
Professor JOHNSON.

Three hours. Through the year. Elective for students who presented advanced French for admission or who have credit for 2, 3, 4. *Tu., Wed., Sat., at 9.25.*

8, 9, 10. *French Literature from 1800 to 1850*
Professor JOHNSON.

Three hours. Through the year. Elective for students who have credit for 5, 6, 7. *Mon., Wed., Th., at 10.25.*

[11, 12, 13. *French Literature since 1850*]
Not offered in 1910–11.

20, 21, 22.† *French Literature from 1600 to 1800*
Mr. CHINARD.

23, 24, 25. *The French Drama*
Professor LANGDON.

Three hours. Through the year. Elective for students who have credit for 7, 10, or 13. *Tu., Wed., Sat., at 9.25.*

26, 27, 28.† *Modern Italian*
Professor LANGDON.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern foreign language. *Mon., Th., Fri., at 9.20.*

35, 36, 37. *Dante in English*

Professor LANGDON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.25.*

38, 39, 40.† *Modern Spanish*

Professor JOHNSON.

Three hours. Through the year. Elective for Juniors, and for Sophomores not electing more than one other modern foreign language. *Tu., Fri., Sat., at 10.20.*

41, 42, 43.† *Spanish Language and Literature*

Professor JOHNSON.

Three hours. Through the year. Elective for students who have credit for 38, 39, 40. *Mon., Wed., Th., at 11.20.*

SOCIAL AND POLITICAL SCIENCE

POLITICAL SCIENCE

1. *Political Science, Elementary*

Professor DEALEY.

Three hours. Second term. Sophomore, Junior, or Senior year. Required of candidates for the degree of Bachelor of Arts; elective for others. *Tu., Th., Sat., at 12.25.*

3, 4.† *American Government*

Professor DEALEY.

Three hours. First and second terms. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

5.† *Comparative Study of Constitutions*

Professor DEALEY.

Three hours. Third term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

SOCIAL SCIENCE

1. *Social Science, Elementary*

Professor DEALEY.

Three hours. Third term. Sophomore, Junior, or Senior year. Must be preceded by Political Science 1. Required of candidates for the degree of Bachelor of Arts; elective for others. *Tu., Th., Sat., at 12.25.*

2. *Social Institutions, Conditions, and Problems*

Professor Kirk.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.25.*

3.† *Origin and Development of Society*

Professor Ward.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

4.† *Social Philosophy*

Professor Ward.

Three hours. First and second terms. Followed in third term by Social Science 5. Elective for Seniors and Graduates. *Wed., Fri., Sat., at 11.20.*

5.† *Application of Sociological Principles*

Professor Ward.

Three hours. Third term. Elective for Seniors and Graduates. *Wed., Fri., Sat., at 11.20.*

20, 21, 22.† *Investigation of Special Topics*

Under the direction of *Professor* Kirk.

Three hours. Six hours of attendance. Through the year. Elective for those who have had or who elect Social Science 2.

MUSIC

1, 2, 3. *The Evolution of Modern Music*

Professor MacDougall.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. No previous knowledge of music required. *Mon., Th., at 11.25.*

PHYSICAL TRAINING

Mrs. Paine

From the close of the Thanksgiving Recess to March 10, all first and second year students are required to attend gymnasium classes three times a week, as follows:

Sophomore Division: *Mon., Tu., Th., 2.30 to 3.15.*
Freshmen Division: *Mon., Tu., Th., 3.25 to 4.10.*
A voluntary class for Juniors and Seniors will be held on *Fri. at 2.30.*

ANNOUNCEMENT OF COURSES
OFFERED IN
BROWN UNIVERSITY
1910–1911

PROVIDENCE, RHODE ISLAND
PUBLISHED BY THE UNIVERSITY
1910

CALENDAR 1910–1911

Vacations and holidays occurring within the academic year 1910–11 are indicated by dark type.

1910

S	M	T	W	T	F	S
JULY						
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						
AUG.						
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			
SEPT.						
				1	2	3
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18	19	20	21	22	23	24
25	26	27	28	29	30	
OCT.						
						1
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9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					
NOV.						
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	**24**	25	26
27	28	29	30			
DEC.						
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18	19	20	21	22	**23**	**24**
25	**26**	**27**	**28**	**29**	**30**	**31**

1911

S	M	T	W	T	F	S
JAN.						
1	**2**	**3**	4	5	6	7
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29	30	31				
FEB.						
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12	13	14	15	16	17	18
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26	27	28				
MAR.						
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12	13	14	15	16	17	18
19	20	21	**22**	**23**	**24**	**25**
26	**27**	**28**	29	30	31	
APR.						
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30						
MAY						
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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	**30**	31			
JUNE						
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18	19	20	21	22	23	24
25	26	27	28	29	30	

1911

S	M	T	W	T	F	S
JULY						
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30	31					
AUG.						
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SEPT.						
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OCT.						
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NOV.						
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DEC.						
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24	25	26	27	28	29	30
31						

THE UNIVERSITY CALENDAR 1910–11

1910	
September 7.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
September 22–27.	*Thursday, Friday, Saturday, Monday, and Tuesday.* Examinations for admission to the Freshman Class and to advanced standing.
September 26, 27.	*Monday and Tuesday.* Registration of new students and enrolment of students previously in residence.
September 28.	*Wednesday.* Academic Year begins (fourth Wednesday in September). Last day for registration of Graduate students.
October 8.	*Saturday.* Examination in Greek for the President's Premiums, 5 Maxcy Hall, 2.30 p.m.
October 12.	*Wednesday.* Examination in Latin for the President's Premiums, 1 Sayles Hall, 2.30 p.m.
October 15.	*Saturday.* Examination in Mathematics for the Hartshorn Premiums, 27 Wilson Hall, 2 p.m.
October 19.	*Wednesday.* Examination in French for the Hicks Premiums, 1 Sayles Hall, 2.30 p.m.
October 22.	*Saturday.* Examination in German for the Hicks Premiums, 5 Sayles Hall, 2.30 p.m.
November 24.	*Thursday.* Thanksgiving Day. No University exercises.
December 14–22.	*Wednesday to Thursday.* Term examinations.
Dec. 23, 1910 to January 3, 1911.	*Thursday to Tuesday.* Christmas Recess.
1911	
January 2, 3.	*Monday and Tuesday.* Enrolment of Undergraduate students.
January 4.	*Wednesday.* Second Term begins.

January 31.	*Tuesday.* Last day for applications of competitors for the Carpenter Prizes in Elocution.
February 22.	*Wednesday.* Washington's Birthday. No University exercises.
March 13–21.	*Monday to Tuesday.* Term examinations.
March 22–28.	*Wednesday to Tuesday.* Spring Recess.
March 27, 28.	*Monday and Tuesday.* Enrolment of Undergraduate students.
March 28.	*Tuesday.* Last day for receiving essays submitted in competition for the Gaston Prize Medal.
March 29.	*Wednesday.* Third Term begins.
April 1.	*Saturday.* Last day for receiving applications for examination for the degree of Doctor of Philosophy, or of Master of Arts *in absentia.*
April 15.	*Saturday.* Last day for receiving applications for the Grand Army of the Republic Fellowship.
April 29.	*Saturday.* Last day for receiving theses of candidates for the degree of Doctor of Philosophy. Last day for receiving Commencement orations.
May 2.	*Tuesday.* Carpenter Prize Speaking Competition.
May 6.	*Saturday.* Last day for receiving essays submitted in competition for the Bishop McVickar prizes.
May 9.	*Tuesday.* Gaston Prize Medal Competition.
May 16.	*Tuesday.* Hicks Prize Debate.
May 30.	*Tuesday.* Memorial Day. No University exercises.
June 1.	*Thursday.* Last day for examinations for advanced degrees.
June 8–16.	*Thursday to Friday.* Term examinations.
June 18.	*Sunday.* Baccalaureate Sermon, First Baptist Meeting House, 4.30 p.m.
June 19.	*Monday.* Class Day.

June 20.	*Tuesday.* Annual Meeting of the Phi Beta Kappa Society, Administration Building, 9.30 a.m. Ivy Day, Pembroke Hall. Annual Meeting of the Associated Alumni, Manning Hall, 2 p.m. Oration before the Phi Beta Kappa Society, Sayles Memorial Hall, 4 p.m.
June 21.	*Wednesday.* One Hundred and Forty-Third Annual Commencement (third Wednesday in June), First Baptist Meeting House, 10 a.m.
June 22.	*Thursday.* Meeting of the Corporation.
June 22 to Sept. 26.	Summer Vacation.
September 6.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
September 20–25.	*Wednesday, Thursday, Friday, Saturday, and Monday.* Examinations for admission to the Freshman class and to advanced standing.
September 25, 26.	*Monday and Tuesday.* Registration of new students and enrolment of students previously in residence.
September 27.	*Wednesday.* Academic Year begins (fourth Wednesday in September).

ADMISSION TO THE UNIVERSITY

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METHODS OF ADMISSION TO THE FRESHMAN CLASS

I. ENTRANCE EXAMINATIONS CONDUCTED BY THE UNIVERSITY. Examinations for admission to the Freshman class are given by the University in September at the times and places indicated below. The University no longer offers entrance examinations in June; candidates desiring to be examined in June must take the examinations conducted under the supervision of the College Entrance Examination Board, for which see pages 7, 8. A candidate may, at his option, take all his examinations in June or in September, or he may take part in June and part in September. Before taking any examination conducted by the University, a candidate must present to the Registrar a letter of recommendation from the principal of his preparatory school and secure a card admitting him to the examination. This may be done by correspondence, provided that the written application and the recommendation are received not less than one week before the date of the first examination.

If a candidate offers subjects in excess of those required for admission, he may be examined in them at the times scheduled below and receive credit for them as college studies.

The order of the examinations in 1910 will be as follows:

THURSDAY, SEPTEMBER 22
Algebra, 27 Wilson Hall, 8 a.m. to 10 a.m.
Plane Geometry, 27 Wilson Hall, 10 a.m. to 12 m.
Elementary French, 26 Wilson Hall, 1 p.m. to 3 p.m.
Advanced French, 2 Wilson Hall 3.30 p.m. to 5.30 p.m.

FRIDAY, SEPTEMBER 23
English A, 26 Wilson Hall, 8 a.m. to 9.30 a.m.
English B, 26 Wilson Hall, 9.30 a.m. to 11 a.m.
Elementary Latin, 25 Wilson Hall, 12 m. to 2 p.m.
Advanced Latin, 25 Wilson Hall, 2 p.m. to 3.30 p.m.
American History, 27 Wilson Hall, 4 p.m. to 6 p.m.

SATURDAY, SEPTEMBER 24
Elementary German, 2 Wilson Hall, 8 a.m. to 10 a.m.
Advanced German, 2 Wilson Hall, 10 a.m. to 12 m.
Chemistry, 2 Wilson Hall, 1 p.m. to 3 p.m.
Solid Geometry, 27 Wilson Hall, 3 p.m. to 5 p.m.
Plane Trigonometry, 27 Wilson Hall, 5.30 p.m. to 7.30 p.m.

MONDAY, SEPTEMBER 26

Astronomy, 25 Wilson Hall, 8 a.m. to 10 a.m.
Physiography, 25 Wilson Hall, 10 a.m to 12 m.
Botany, 2 Wilson Hall, 8 a.m. to 10 a.m.
Greek and Roman History, 25 Wilson Hall, 1 p.m. to 3 p.m.
Physics, 1 Wilson Hall, 4 p.m. to 6 p.m.

TUESDAY, SEPTEMBER 27

Elementary Greek, 2 Wilson Hall, 8 a.m. to 10 a.m.
Advanced Greek, 2 Wilson Hall, 10 a.m. to 11.30 a.m.
English History, 25 Wilson Hall, 12.30 p.m. to 2.30 p.m.
Medieval and Modern History, 26 Wilson Hall, 3 p.m. to 5 p.m.

For students already pursuing courses in the University, entrance examinations are also given by the University at the close of the Christmas recess. Students desiring to take these examinations must file written applications with the Registrar before December 1. No student who has failed in an entrance examination will be granted a second examination at any time other than September, except on presentation of a tutor's certificate that he is prepared for such examination and on payment of a fee of two dollars. No entrance examinations other than those appointed above will be held unless ordered by vote of the Committee on Registration and Attendance.

II. ENTRANCE EXAMINATIONS CONDUCTED BY THE COLLEGE ENTRANCE EXAMINATION BOARD. Examinations conducted under the supervision of the College Entrance Examination Board will be accepted in place of the corresponding examinations conducted by Brown University. In 1910 these examinations will be held June 20-25.

All applications for these examinations must be addressed to the Secretary of the College Entrance Examination Board, Post Office Sub-Station 84, New York, and must be made upon a blank form to be obtained from the Secretary of the Board upon application. Applications for examination at points in the United States east of the Mississippi River, also at Minneapolis, St. Louis, and other points on the Mississippi River, must be received by the Secretary of the Board on or before Monday, June 4, 1910; application for examination elsewhere in the United States or in Canada must be received on or before Monday, May 30, 1910; and applications for examinations at points outside the United States and Canada must be received on or before Monday, May 16, 1910. Applications received later than the dates named will be accepted when it is possible to arrange for the examinations of the candidates concerned, but only upon the payment of $5 in addition to the regular fee.

The examination fee is $5 for all candidates examined at points in the United States and Canada, and $15 for all candidates examined at points outside of the United States and Canada. The fee (which cannot be accepted in advance of the application) should be remitted by postal order, express order, or draft on New York, to the order of the College Entrance Examination Board.

A list of the places at which examinations are to be held by the Board in June, 1910, will be published about March 1. Requests that the examinations be held at particular points, to receive proper consideration, should be transmitted to the Secretary of the Board not later than February 1.

III. ADMISSION BY CERTIFICATE. Students are admitted upon presentation of a certificate signed by the principal of any school which has the privilege of issuing certificates to Brown University.

Principals of schools in New England who desire the certificate privilege for Brown University, or for any other college represented on the New England College Entrance Certificate Board, should address the Secretary of the Board, Professor Nathaniel F. Davis, 159 Brown Street, Providence, R. I., who will furnish the necessary application blanks. These blanks must be returned to him before April 1 of the year for which the certificate privilege is desired.

The principals of schools situated outside of New England who desire the certificate privilege must make application to the Registrar of the University before May 1, and must furnish satisfactory evidence that the course of study in the school meets the requirements for admission. Blank forms for this purpose will be supplied on request. Certificates from the New York Board of Regents are accepted for the specified subjects so far as they coincide with the entrance requirements of Brown University.

Certificates are accepted for admission to the Freshman class only, not for admission to advanced standing. If any candidate offers subjects in excess of those required for admission he may be examined in them at the times indicated on pages 6, 7, and receive credit for them as college studies.

Blank forms for the certification of candidates may be obtained from the Registrar by the principals of schools having the privilege of certification. These forms should be filled out and returned to him by July 1. When a student has attended more than one school, a letter of recommendation from the principal of the school last attended must accompany the certificate.

REGISTRATION AND ENROLMENT OF UNDERGRADUATES

REGISTRATION. In September of each year all new students, whether candidates for a degree or special students, must report at the Administration Building between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first term, and fill out registration cards for the whole of the ensuing year. Failure to comply with this rule will be treated as late registration and a fee of three dollars will be charged. All new students must present at or before the time of registration all credentials necessary for admission as candidates for a degree or as special students.

In May of each year all undergraduates in residence, whether candidates for a degree or special students, must obtain at the Registrar's office registration cards for the next year; these cards must be filled out by the students with a statement of the courses elected for the whole of the ensuing year, and returned not later than June 1. Failure to comply with this rule will be treated as late registration and a fee of three dollars will be charged.

Courses bearing a single number must be elected as a whole. When term courses are grouped in one paragraph (*e.g.* Astronomy 1, 2, 3), the second term may not be taken without the first, nor the third without the second, unless specific statement to the contrary is made. In starred courses a final mark covering the work of the course as a whole will be given at the end of the course, the marks given at the end of the preceding term or terms being regarded as temporary. Changes in registration will be allowed only on presentation of sufficient reasons to the Committee on Registration and Attendance. Requests for permission to make changes in September must be presented to the committee between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first term. Requests for permission to make changes for the second or third term must be presented to the committee before the beginning of the examinations of the first and second terms respectively, unless these requests are the result of failures, in which case they must be presented in writing to the Registrar two days before the opening of the second and third terms respectively.

ENROLMENT. In September all students whose registration cards have been already approved must report at the Registrar's office between 9.30 a.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first term and have their names checked as enrolled for the term. Failure to report will be treated as late enrolment and a fee of three dollars will be charged.

At the beginning of the second and third terms all undergraduates must report at the Registrar's office between 9.30 a.m. and 5 p.m. on one of the two days preceding the opening of the term and have their names checked as enrolled for the term. Failure to report will be treated as late enrolment and a fee of three dollars will be charged.

GRADUATE STUDENTS

Graduate students must report to the Dean of the Graduate Department in No. 5 Wilson Hall between 9 a.m. and 1 p.m. or between 3 and 5 p.m. on the Monday or Tuesday preceding the opening of each term.

REQUIREMENTS FOR DEGREES

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REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ARTS

I. PRESCRIBED SUBJECTS

ANCIENT Languages (either Latin or Greek, or both). Six hours. At least three hours must be taken in the Freshman year, and the six hours must be completed by the end of the Sophomore year.

Modern Languages (either French or German, or both). Six hours. At least three hours must be taken in the Freshman year, and the six hours must be completed by the end of the Sophomore year.

Students presenting elementary French only, must continue French in the Freshman year and take elementary German in either the Freshman or the Sophomore year. Students presenting elementary German only must continue German in the Freshman year and take elementary French in either the Freshman or the Sophomore year. Students presenting elementary French and elementary German only must continue both languages, but may postpone the continuation of one language until the Sophomore year. Students presenting elementary work in one language and elementary and advanced work in the other must take in the Freshman year the language in which the elementary work only was presented. Students presenting elementary and advanced work in both languages may take the required six hours in either French or German, or both.

Mathematics. Four or five hours. Freshman year. Four hours for students not presenting Solid Geometry and Plane Trigonometry. Five hours for students presenting Solid Geometry and Plane Trigonometry.

English. Rhetoric and Composition. Three hours. Freshman year.

European History. Three hours. Sophomore or Junior year.

English Literature. Any one of the courses in English from 10 to 23 inclusive. Sophomore, Junior, or Senior year.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Political Science, Social Science, and Economics. One three-hour, one-term course in each of the three departments. Sophomore, Junior, or Senior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. Required Studies. *Latin* 1, 2, 3 or *Greek* 1, 2, 3. *French* 1 or 2, 3, 4 or *German* 1 or 2. *Mathematics* 3, 1, 2 or *Mathematics* 4, 5; 15, 16. *English* 1.

II. Elective Studies. One three-hour course continuous through the year must be chosen from the following list: *Latin* 1, 2, 3; for students presenting elementary and advanced Latin for admission. *Greek* A, B, C; for students not presenting Greek for admission. *Greek* 1, 2, 3; for students presenting elementary and advanced Greek for admission. *French* 1; for students not presenting French for admission. *French* 2, 3, 4; for students presenting elementary French for admission. *French* 5, 6, 7; for students presenting advanced French for admission. *German* 1; for students not presenting German for admission. *German* 2; for students presenting elementary German for admission; *German* 6, or 7, or 23, 24, 25; for students presenting advanced German for admission. *Greek* 33, *Latin* 28, 29 (*Greek and Roman Life and Institutions*); for all students. *Chemistry* 1, 2, 3; ‡ for all students. *Botany* 1 or *Biology* 1; for all students. *Geology* 3; for all students.

SOPHOMORE YEAR

That portion of the required work in ancient and modern languages not completed in the Freshman year, and other required and elective courses sufficient to make a total of fifteen hours a week.

JUNIOR YEAR

The required History and Physical or Natural Science, if not previously taken, and other required and elective courses sufficient to make a total of fifteen hours a week.

SENIOR YEAR

All required courses not previously taken, and elective courses sufficient to make a total of fifteen hours a week.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF PHILOSOPHY

I. PRESCRIBED SUBJECTS

Modern Languages. An amount sufficient, with the work presented for admission, to complete the elementary course and a year of advanced work in both French and German. A student who is admitted in both advanced French and advanced German must continue one of these languages for one year, three hours a week.

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‡ For admission to Chemistry 4, 5, 6, see page 30.

Mathematics. Four or five hours. Freshman year. Four hours for students not presenting Solid Geometry and Plane Trigonometry. Five hours for students presenting Solid Geometry and Plane Trigonometry.

English. Rhetoric and Composition. Three hours. Freshman year.

European History. Three hours. Sophomore or Junior year.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. REQUIRED STUDIES. *English* 1. *French* 1 or 2, 3, 4 or *German* 1 or 2. *Mathematics* 3, 1, 2 or *Mathematics* 4, 5; 15, 16.

II. ELECTIVE STUDIES. Two three-hour courses continuous through the year must be chosen from the following list: *Latin* 1, 2, 3; for students presenting elementary and advanced Latin for admission. *Greek* A, B, C; for students not presenting Greek for admission. *Greek* 1, 2, 3; for students presenting elementary and advanced Greek for admission. *French* 1; for students not presenting French for admission. *French* 2, 3, 4; for students presenting elementary French for admission. *French* 5, 6, 7; for students presenting advanced French for admission. *German* 1; for students not presenting German for admission. *German* 2; for students presenting elementary German for admission. *German* 6, or 7, or 23, 24, 25; for students presenting advanced German for admission. *Greek* 33, *Latin* 28, 29 (*Greek and Roman Life and Institutions*); for all students. *Chemistry*, 1, 2, 3; ‡ for all students, *Botany* 1 or *Biology* 1; for all students. *Geology* 3; for all students. *Mechanical Drawing* 2, 3; for all students.

SOPHOMORE YEAR

That portion of the required work in modern languages not completed in the Freshman year, and other required and elective courses sufficient to make a total of fifteen hours a week.

JUNIOR YEAR

The required History and Physical or Natural Science, if not previously taken, and other required and elective courses sufficient to make a total of fifteen hours a week.

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‡ For admission to Chemistry 4, 5, 6, see page 30.

SENIOR YEAR

All required courses not previously taken, and elective courses sufficient to make a total of fifteen hours a week.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN CIVIL ENGINEERING

FRESHMAN YEAR

First Term	*Second Term*	*Third Term*
Mathematics 17	Mathematics 18	Mathematics 19
Mech. Drawing 6	Mech. Drawing 6	Mech. Drawing 6
English 1	English 1	English 1

and two of the following courses, Chemistry, French, German, Spanish, *subject to the direction of the Committee on Registration and Attendance.*

SOPHOMORE YEAR

Mathematics 20	Mathematics 21	Mathematics 21
Mech. Drawing 1	Mech. Drawing 1	Mech. Drawing 1
Civil Engineering 4	Civil Engineering 5	Civil Engineering 6
Physics 1	Physics 2	Physics 3
‡Economics 1	‡Political Science 1	‡Social Science 1
	Civil Engineering 7	§Civil Engineering 8
	Civil Engineering 9	Civil Engineering 10

JUNIOR YEAR

Civil Engineering 11	Civil Engineering 12	Civil Engineering 19
Mechanics 1	Mechanics 1	Mechanics 3
Astronomy 4	Astronomy 5	
Physics 24	Physics 24	Physics 24
Elect. Engineering 1	Elect. Engineering 2	Civil Engineering 15
Geology 17	Civil Engineering 14	Geology 16

SENIOR YEAR

Civil Engineering 23	Civil Engineering 31	Civil Engineering 17
Civil Engineering 25	Civil Engineering 29	Civil Engineering 18
Civil Engineering 26	Civil Engineering 27	Civil Engineering 28
Civil Engineering 35	Civil Engineering 35	Civil Engineering 24
Mech. Engineering 22	Mech. Engineering 22	Civil Engineering 36

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‡ Or some other three-term course, in the Department of English, or History, or Philosophy, chosen with the approval of the head of the Department of Civil Engineering.

§ Civil Engineering 8 is taken during the spring recess.

First Term	*Second Term*	*Third Term*
Mechanics 2	Mechanics 2	Civil Engineering 32
Civil Engineering 13	Civil Engineering 30	Civil Engineering 34
		Botany 7

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

FRESHMAN YEAR

First Term	*Second Term*	*Third Term*
Mathematics 17	Mathematics 18	Mathematics 19
Mech. Drawing 6	Mech. Drawing 6	Mech. Drawing 6
English 1	English 1	English 1

and two of the following courses, Chemistry, French, German, Spanish, *subject to the direction of the Committee on Registration and Attendance.*

SOPHOMORE YEAR

Mathematics 20	Mathematics 21	Mathematics 21
Mech. Drawing 1	Mech. Drawing 1	Mech. Drawing 1
Mech. Drawing 4	Mech. Drawing 5	Mech. Engineering 8
Physics 1	Physics 2	Physics 3
‡Economics 1	‡Political Science 1	‡Social Science 1
	Mech. Engineering 1	Mech. Engineering 3

JUNIOR YEAR

Mechanics 1	Mechanics 1	Mechanics 3
Mech. Engineering 4	Mech. Engineering 5	
Mech. Engineering 9	Mech. Engineering 10	Mech. Engineering 11
Physics 24	Physics 24	Physics 24
Elect. Engineering 1	Elect. Engineering 2	Elect. Engineering 3
Elect. Engineering 7	Elect. Engineering 8	Elect. Engineering 9

SENIOR YEAR

Mechanics 2	Mechanics 2	
Mathematics 9	Elect. Engineering 11	§Physics 19
Elect. Engineering 4	Elect. Engineering 5	Elect. Engineering 6
Physics 23		Physics 23
	Elect. Engineering 12	Elect. Engineering 13
Elect. Engineering 14	Elect. Engineering 14	Elect. Engineering 14
Mech. Engineering 16	Mech. Engineering 17	Mech. Engineering 18
Mech. Engineering 22	Mech. Engineering 22	Civil Engineering 32

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‡ Or some other course, not technical, chosen with the approval of the head of the Department of Electrical Engineering.

§ Or an equivalent.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

FRESHMAN YEAR

First Term	*Second Term*	*Third Term*
Mathematics 17	Mathematics 18	Mathematics 19
Mech. Drawing 6	Mech. Drawing 6	Mech. Drawing 6
English 1	English 1	English 1

and two of the following courses, Chemistry, French, German, Spanish, *subject to the direction of the Committee on Registration and Attendance.*

SOPHOMORE YEAR

Mathematics 20	Mathematics 21	Mathematics 21
Mech. Drawing 1	Mech. Drawing 1	Mech. Drawing 1
Mech. Drawing 4	Mech. Drawing 5	Mech. Engineering 8
Physics 1	Physics 2	Physics 3
‡Economics 1	‡Political Science 1	‡Social Science 1
	Mech. Engineering 1	Mech. Engineering 2

JUNIOR YEAR

Mech. Engineering 19	Mech. Engineering 20	Mech. Engineering 21
Mech. Engineering 16	Mech. Engineering 17	Mech. Engineering 18
Mech. Engineering 3	Mech. Engineering 4	
Mech. Engineering 9	Mech. Engineering 10	Mech. Engineering 11
Mechanics 1	Mechanics 1	Mechanics 3
Physics 24	Physics 24	Physics 24

SENIOR YEAR

Mech. Engineering 22	Mech. Engineering 22	
Mech. Engineering 5	Mech. Engineering 6	
Mech. Engineering 12	Mech. Engineering 13	Mech. Engineering 14
Mechanics 2	Mechanics 2	Mech. Engineering 15
Elect. Engineering 1	Elect. Engineering 2	Elect. Engineering 3
Mech. Engineering 23	Mech. Engineering 24	Civil Engineering 32
Mech. Engineering 25	Mech. Engineering 25	Mech. Engineering 25

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‡ Or some other course, in the Department of English, or History, or Philosophy, chosen with the approval of the head of the Department of Mechanical Engineering.

UNIVERSITY FEES

FEES FOR UNDERGRADUATES. *Tuition:* $35 a term; $105 a year. *Incidentals:* $16 a term; $48 a year. *Matriculation fee* (Freshmen year only): $5. *Graduation fee* (Senior year only): $8.

The incidental expenses are for the printing of programs, examination papers, and the like, the use of the library and the gymnasium, heat for these buildings and for the recitation rooms, and the wages of servants to care for them.

Special students who are taking courses amounting to less than fifteen hours a week pay in proportion to the actual amount taken.

FEES FOR RESIDENT GRADUATE STUDENTS. *Tuition:* $50 a term; $150 a year. *Graduation fee:* for the degree of Master of Arts, $15; for the degree of Master of Science, $15; for the degree of Doctor of Philosophy, $25.

Graduate students who are taking courses amounting to less than fifteen hours a week pay $10 for each three-hour course.

A candidate in residence for the degree of Master of Arts or Master of Science who has paid full tuition for one year may, if necessary to the attainment of his degree, continue his studies for one year more without additional charge.

A candidate in residence for the degree of Master of Arts, who without remitting his studies becomes a candidate for the degree of Doctor of Philosophy, is credited with whatever tuition he has already paid, in case his previous work is allowed to count toward the higher degree.

A candidate for the degree of Doctor of Philosophy who has paid full tuition for two years may, if necessary to the attainment of his degree, continue his studies for two years more without additional charge.

FEES FOR NON-RESIDENT GRADUATE STUDENTS. *Registration fee:* $25. *Tuition:* $10 a term; $30 a year. *Examination fee:* $15.

A non-resident candidate is entitled, upon payment of the registration and tuition fees, to take one three-hour course in residence. For each additional course taken in residence, a fee of $10 is charged.

A non-resident candidate who has paid tuition for two years may, if necessary to the attainment of his degree, continue his studies for one year more without additional charge, except for work taken at the University.

LABORATORY FEES. In addition to the regular fees mentioned above the following fees are charged for laboratory courses. These fees cover the cost of ordinary supplies; special supplies and breakage are charged extra. *Chemistry*, 1, 2, 3, $3 *a term. Chemistry*, advanced 3-hour course, $5 *a term. Chemistry*, advanced 6-hour course, $10 *a term. Botany*, each 3-hour course, $3 *a term. Biology*, each 3 hour course, $3 *a term. Physics*, each 3-hour course,

$5 *a term. Mechanical Engineering*, each 3-hour course, $5 *a term. Electrical Engineering*, each 3-hour course, $5 *a term. Geology*, each 3-hour course, $3 *a term.*

SPECIAL FEES. Candidates for a first degree who do not pay full tuition fees for four years must pay for all extra courses counted toward the degree at the rate of $5 per term for each three-hour course. This amount must be paid at the beginning of the term preceding the completion of the degree work. This rule does not apply to courses credited from other institutions or taken during the summer.

Candidates for the degree of A.M. or Sc.M. who do not pay full tuition fees for one year, and candidates for the degree of Ph.D. who do not pay full tuition fees for two years, must pay for all extra courses counted toward the degree at the rate of $5 per term for each three-hour course. This amount must be paid at the beginning of the term preceding the completion of the degree work. This rule does not apply to courses credited from other institutions.

PAYMENT OF TERM BILLS

Every student, graduate or undergraduate, must pay in advance, at registration for each term, all charges for tuition and incidentals for such term.

Students occupying dormitory rooms must also pay at the above time all room charges for the term.

Students taking laboratory courses must also pay at the above time all laboratory fees for the term. These fees vary from $3 to $5 for each three-hour laboratory course.

At the beginning of the third term all students occupying dormitory rooms or taking laboratory courses must, in addition to the payment of the above amounts, make a deposit of $5 toward charges for light or breakage during that term.

Freshmen, candidates for degrees, must pay at registration for the first term a matriculation fee of $5.

Candidates for graduation in any year must pay all graduation fees at the beginning of the third term of that year.

COURSES OF INSTRUCTION

IN every department the courses that bear a single number must be elected as a whole. When term courses are grouped in one paragraph (e.g. *Astronomy 1, 2, 3*), *the second term may not be taken without the first, nor the third without the second, unless specific statement to the contrary is made. In starred courses a final mark covering the work of the course as a whole is given at the end of the course, the marks given at the end of the preceding term or terms being regarded as temporary. When the time of meeting is not announced, it will be arranged by the instructor at the beginning of the term.*

I. ART

WILLIAM CAREY POLAND, A.M., LITT. D., *Professor of the History of Art*

1, 2, 3. *History of Art from Antiquity through the Renaissance*

First term, ancient art; a general course in the history of ancient art, chiefly Greek. Second term, Roman, early Christian, and Medieval art; a study of Roman, Romanesque, and Gothic art, with some notice of Byzantine, Arabian, and Oriental art. Third term, art of the Renaissance; the fifteenth and sixteenth centuries; the effect on art of the dominant motives of the epoch, the development of art in the different countries of Europe, the great masters and their most significant works. Text-book, lectures, lantern views. Students who elect this course are advised to elect also, if possible, course 11, *Practical Work in Art.*

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Wed., Th., at 10.20.*

4, 5. *Modern Art*

First term, the seventeenth and eighteenth centuries. Second term, the nineteenth century. Text-book, lectures, special assigned topics, lantern views.

Three hours. First and second terms. Elective for Juniors, Seniors, and Graduates, who have credit for 3. *Tu., Th., Sat., at 12.20.*

6. *Theory and Criticism of the Fine Arts*

A study of the more important facts and laws of artistic production. Text-book, special assigned topics, illustrated lectures.

Three hours. Third term. Elective for students who have credit for any one of the courses 1 to 5. *Tu., Th., Sat., at 12.20.*

12. *Renaissance Art, Advanced Course*

Critical study of the art of the fifteenth and sixteenth centuries, particularly Italian. A more detailed study of the spiritual conditions, the influences, and the masters, than in 3.

Three hours. Through the year. Elective for students who have credit for 3. *Mon., Th., Fri., at 9.20.*

7. *Seminary in Classical Architecture*

Critical study; reading of Vitruvius in Latin; discussion of the principles followed by the Greek and Roman architects, and of the influence of Vitruvius upon the Renaissance.

Three hours. Second and third terms. Elective for Graduates. Offered if three or more elect the course. It is advised that application be made to Professor Poland at an early date.

[8. *Seminary in Greek and Roman Sculpture*]

An archaeological course based on Overbeck's *Schriftquellen.*

Three hours. Through the year. Elective for Graduates who read Greek and Latin. Not offered in 1910–11.

9. *Seminary Study of the Acropolis of Athens*

Critical reading, in Greek, of Pausanias' account of the Acropolis of Athens; lectures and illustrations.

Three hours. First term. Elective for Graduates who read Greek and Latin. Offered if three or more elect the course. It is advised that applications be made to Professor Poland at an early date.

10. *Freehand Drawing*

Training of hand and eye by progressive study of models of machine parts, casts of ornamental forms, and still-life objects.

One hour. Two hours of drawing. Through the year. Elective for all students. Given at the Rhode Island School of Design. *Tu., or Th., or Fri., at 2.20.*

11. *Practical Work in Art*

Six hours of drawing or other practical work. To illustrate the principles of delineation, light and shade, and color, and the principles of design in architecture, sculpture, and painting, as exemplified in the historic forms of art.

Three hours. Through the year. Elective for students who have credit for 10, and who have taken or are taking 1, 2, 3. Given at the Rhode Island School of Design. *Tu., Th., Fri., at 2.20.*

13. *Architectural Design*

Principles of architectural design and composition taught by means of lectures, problems in design, and working drawings.

Three hours. One hour of recitation and four hours of drawings. Through the year. Elective for students who have credit for Art 10 and Mechanical Drawing 1. Given at the Rhode Island School of Design by Mr. HUGER ELLIOTT, Director. *Th. at 3.20.*

II. ASTRONOMY

WINSLOW UPTON, A.M., Sc.D., *Professor of Astronomy*
————————————, *Instructor in Astronomy*

1, 2, 3. *General Course*

Fundamental conceptions of the science; methods of professional study; present state of our knowledge of the heavenly bodies. Designed either for purposes of general culture or as a preparation for advanced work.

Three hours. Through the year. Elective for Juniors and Seniors who have credit for Mathematics 3, 1, 2. *Tu.*, *Th.*, *Fri.*, *at 3.20.* Observations at Ladd Observatory.

4, 5. *Field Astronomy*

Application of astronomy to geodesy; the problems of time, latitude, longitude, and azimuth. Computations and observations.

Three hours. First and second terms. Required of candidates for the degree of Bachelor of Science in Civil Engineering. Elective for Juniors and Seniors who have credit for Mathematics 3, 1, 2. May be taken at the same time as 1, 2, 3. Followed in the third term by Civil Engineering 15. *Mon.*, *Tu.*, *Th.*, *at 2.20.* Observations at Ladd Observatory.

13, 14, 15. *Advanced Astronomy*

Subjects selected to meet the requirements of individual students.

Three hours. Through the year. Elective for Graduates and approved Undergraduates.

III. BIBLICAL LITERATURE AND HISTORY‡

Henry Thatcher Fowler, Ph.D., *Professor of Biblical Literature and History*

Nathan Stern, Ph.D., *Lecturer in Biblical Literature and History*

LANGUAGES

1. *Elementary Hebrew*

Grammar; exercises in writing Hebrew; translation of parts of Genesis and Deuteronomy. *Professor* Fowler *and Dr.* Stern.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

2. *Historical Hebrew*

Reading of the books of Samuel and Kings with special attention to the acquisition of a vocabulary; review of the elements of Hebrew grammar and study of syntax. *Dr.* Stern.

Three hours. Through the year. Elective for students who have credit for 1.

3. *Hebrew Literature*

Prophetic literature. Critical translation of the prophetic books of the Old Testament and study of the development of Israel's prophecy. In succeeding years corresponding courses in the Psalm, Wisdom, and Legal literature of the Old Testament will be offered. *Professor* Fowler.

Three hours. Through the year. Elective for Graduates and approved Undergraduates.

4. *Textual Criticism of the Old Testament*

The principles and method of textual criticism, in connection with the study of one of the shorter prophetical books.

Three hours. One term. Offered if applied for by Graduates.

5. *Biblical Aramaic*

Grammar and reading of the Aramaic portions of the Old Testament. *Dr.* Stern.

Three hours. One term. Offered if applied for by students who have credit for 1.

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‡ For conditions under which students may receive credit in the Newton Theological Institution for work done in this department, see the Catalogue, page 161.

6. *Elementary Arabic*

Grammar; exercises in writing Arabic; translation of prose selections. *Professor* Fowler.

Two hours. Through the year. Elective for Seniors and Graduates.

[7, 8, 9. *Gospels and Epistles*]

First term, the Johannine writings. Second term, the Gospel of Mark and the First Epistle of Peter. Third term, the Gospels of Matthew and Luke. First and second terms, *Professor* Fowler. Third term, *Professor* Allinson.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. Not offered in 1910–11.

10, 11, 12. *Acts and Pauline Epistles*

Characteristics of Hellenistic Greek; translation, and investigation of date, authorship, and thought. First term, Acts. Second term, Thessalonians and Galatians. Third term, Corinthians and Romans. If desired by the class, translation from the writings of Justin Martyr may be substituted for the specified reading of the third term. First and second terms, *Professor* Fowler. Third term, *Professor* ——.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently.

LITERATURE AND HISTORY IN ENGLISH‡

13, 17, 18. *Old Testament Literature and History*

First term, early Semitic history, the formative age of Hebrew history, and Hebrew literature before the Monarchy. Second term, history and literature of the Hebrew Monarchy. Third term, Jewish history and literature from the Captivity to the conquest of Alexander. Includes nearly the entire Old Testament history and literature. In connection with 14, 19, 20, gives a comprehensive view of Biblical history and literature. The books are read in the best English translations. *Professor* Fowler.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Wed., Th., at 10.20.*

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‡ Course 21, 22, 23 gives a rapid survey of the Bible as a part of the world's literature. It is designed especially for those who do not expect to pursue further courses in this department.

Courses 13, 17, 18 and 14, 19, 20 are introductory to more detailed courses in the University or the Theological Seminary. They are also designed for those who, without intending to specialize in this field, desire a comprehensive view of the nature and results of the historical as well as the literary study of the Bible.

[14, 19, 20. *New Testament Literature and History*]

First term, the Greek, Maccabean, and Roman ages of Jewish history and literature. Second term, the four Gospels and the life of Christ. Third term, the Acts, Epistles, Apocalypse, and the history of the Apostolic age. Includes a large part of the Jewish writings from the conquest of Alexander to the destruction of Jerusalem, and the entire New Testament, studied in its Jewish setting. Emphasis placed upon the connection between the history and the literature. In connection with 13, 17, 18, gives a comprehensive view of Biblical history and literature. The books are read in the best English translations. *Professor* FOWLER.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Not offered in 1910–11.

21, 22, 23. *The English Bible as Literature*

An outline of the literary history of the Old and New Testaments; the literary forms represented in the Bible; the place of the Bible in English literature. Emphasis placed upon the literature itself and its connection with the present. Lectures and assigned readings from the English Bible. First term, Old Testament literature from the beginning to the fall of Jerusalem in 586 B.C. Second term, from the Babylonian exile to the completion of the Old Testament. Third term, the New Testament. *Professor* FOWLER.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon.*, *Tu.*, *Th.*, *at 11.20.*

15.* *Biblical Seminary*

Subject for 1910–11: Messianic Prophecy. *Professor* FOWLER.

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors.

16. *Principles of Historical Criticism and Research*

This course is the same as course 25 offered by the Department of History. *Professor* MACDONALD.

One hour. One term. Elective for Graduates of one year's standing. Required of all candidates for the degree of Doctor of Philosophy in Biblical Literature and History.

IV. BIOLOGY ‡

Albert Davis Mead, Ph.D., *Professor of Biology*
Frederic Poole Gorham, A.M., *Associate Professor of Biology*
Herbert Eugene Walter, Ph.D., *Assistant Professor of Biology*
Philip Henry Mitchell, Ph.D., *Instructor in Physiology*
Frank Taylor Fulton, Sc.B., M.D., *Instructor in Pathology and Histology*
Jay Perkins, M.D., *Demonstrator in Anatomy*
John Burnham Ferguson, A.B., M.D., *Demonstrator in Anatomy*

1. *Introductory Course*

Introductory to all other courses in the department; also designed for those who, without intending to pursue the subject further, desire a general view of biological work and biological theories. Aims to give an introduction to laboratory methods of dissection and experiment and the use of the microscope, to afford a general view of the structure and functions of animals and plants, and to present an outline of the more important biological theories, such as evolution, natural selection, variation, mutation, and heredity. After the first term Biology 1 and Botany 1 are identical and the classes are combined. *Professor* Gorham.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. *Mon., Tu., Th., 2.20 to 4.20.*

2. *Comparative Anatomy of Vertebrates*

Intended not only for the general student, but also for those who are particularly interested in zoology and for those who expect to study medicine. The structure and significance of the various organs of vertebrates with particular reference to man. Students are permitted to attend certain clinics and autopsies at the Rhode Island Hospital. Laboratory work and lectures. *Professor* Walter.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for 1.

3. *Bacteriology*

A general discussion of bacteria in all their relations, with special attention in the laboratory to the methods of studying bacteria, including the isolation, systematic study, and determination of unknown species. Lectures and laboratory work. *Professor* GORHAM.

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‡ It is recommended that the undergraduate courses in Biology be taken in the following order: 1; 2: 10; 4, 5, 3; 7, 8 or 33; 9; 19 or 34, 30, 18; 16 or 17.

Three hours. Six hours of attendance. Third term. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon., Wed., Th., at 10.20.*

4, 5. *Advanced Histology and Pathology*

Advanced work in micro-technic and in normal and pathological histology. Adapted, to some extent, to individual requirements. *Professor* MEAD *and Dr.* FULTON.

Three hours. Six hours of attendance. First and second terms. Elective for Juniors, Seniors, and Graduates, who have credit for 1 and 10.

7. *Chemical Physiology*

Designed both for those who are interested in physiology either from a medical or a general standpoint, and also for those who are specializing in chemistry and desire a knowledge of vital chemical processes. Includes: the chemistry of proteins, carbohydrates, and fats; the physiology of the digestive system, with the study of secretions and of artificial salivary, gastric, and pancreatic digestions; examination of blood, bile, and urine; the analysis of foods with special reference to milk. *Dr.* MITCHELL.

Three hours. Six hours of attendance. First and second terms. Must be preceded by Chemistry 1, 2, 3, and should be preceded by Chemistry 10. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Tu., Fri., Sat., at 10.20.*

8. *Physical Physiology*

The physiology of muscle and nerve; the physics and physiology of the circulatory, respiratory, and alimentary systems; the causes and theories of sleep; the physiology of the special senses. *Dr.* MITCHELL.

Three hours. Six hours of attendance. Third term. Must be preceded by 7. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Tu., Fri., Sat., at 10.20.*

9. *Anatomy of the Nervous System*

A study of the architecture and composition of the brain, nerves, and sense organs in man; comparison with the nervous system of lower vertebrates; relation of nervous structure to mental activity. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1.

10. *Embryology and Histology*

The origin and the development of the individual body; the elementary structure of the adult organs. Practice in micro-technic. Adapted to the requirements of general students and those intending to study medicine. *Professor* Mead.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1.

11. *Biological Theories and Problems*

Seminary course. *Professor* Mead.

One to three hours. Through the year. Elective for Graduates.

12. *Advanced Bacteriology*

Practical work in the preparation of culture media; methods of sterilization and disinfection; qualitative and quantitative biological examination of water, milk, air, soil, and sewage; study of certain pathogenic organisms, with the determination of their pathogenic properties, and the methods of bacteriological diagnosis of disease. Laboratory work and seminary. *Professor* Gorham.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates, who have credit for 3. *Mon., Th., at 4.20.*

13. *Physiology, Advanced Course*

Laboratory work and seminary. *Dr.* Mitchell.

Three to twelve hours. Through the year. Elective for Graduates who have sufficient knowledge of chemistry and physiology.

14. *Human Anatomy*

A course in practical dissection. Laboratory instruction. Students are permitted to attend certain operations at the hospital and to be present at autopsies. *Dr.* Perkins *and Dr.* Ferguson.

Three hours. Through the year. Elective for Graduates.

15. *Special Advanced Work*

Research work arranged to meet the requirements of individual students *Professor* Mead.

Three to twelve hours. Through the year. Elective for Graduates.

[16. *Evolution*]

The history of biology, principles of classification, geographical distribution, heredity, natural selection, variation, Mendelism, and the

relationship of man to the lower animals. Lectures and assigned reading. *Professor* MEAD.

Three hours. Third term. Elective for Juniors and Seniors. Not offered in 1910–11.

17. *Physiology*

A general survey of the activities of living organisms with special reference to the human body, including some applications of modern physiology to healthful living. Lectures and assigned reading. *Dr.* MITCHELL.

Three hours. Third term. Elective for Juniors and Seniors. *Mon., Tu., Th., at 8.*

18. *Ornithology*

A study of birds regarded as a group of living animals in relation to their environment. Lectures and field identification of wild birds during their spring migration. *Professor* WALTER.

One hour. Two hours of attendance. Third term. Elective for Undergraduates.

19. *Entomology*

A study of insects in their scientific and economic relations. Lectures and laboratory work. *Professor* GORHAM.

One hour. Two hours of attendance. First term. Elective for Undergraduates.

30. *Protozoology*

A consideration of the forms and activities of micro-organisms and their relation to disease. Lectures and laboratory work. *Professors* GORHAM *and* WALTER.

One hour. Two hours of attendance. Second term. Elective for Undergraduates.

31. *Bacteriological Research*

Research work arranged to meet the requirements of individual students. *Professor* GORHAM.

Three to twelve hours. Through the year. Elective for Graduates who have credit for 3 and 12.

32. *Zoological Seminary*

Reading and discussion of German zoological literature selected with reference to the needs of individual students. *Professor* WALTER.

One to three hours. Through the year. Elective for Graduates.

33. *Clinical Analysis*

Practice in methods of analysis used in medical diagnosis. Analysis of urine; examination of blood and of feces; gastric analysis. *Dr.* MITCHELL.

Three hours. Six hours of attendance. Third term. Must be preceded by 7. Elective for Juniors, Seniors, and Graduates, and for Sophomores who are not taking any other course in the department.

[34. *Comparative Anatomy of Invertebrates*]

A study of some important features of the anatomy of the invertebrates. Lectures and laboratory work. *Professor* GORHAM.

One hour. Two hours of attendance. First term. Elective for Undergraduates. Not offered in 1910–11.

V. BOTANY ‡

JAMES FRANKLIN COLLINS, PH.B., *Assistant Professor of Botany*

1. *Introductory Course*

Introductory to other courses in the department; also designed for those who, without intending to pursue the subject further, desire a general view of biological work and biological theories. Aims to give an introduction to laboratory methods of dissection and experiment and the use of the microscope, to afford a general view of the structure and functions of plants and animals, and to present an outline of the more important biological theories, such as evolution, natural selection, variation, mutation, and heredity. After the first term Botany 1 and Biology 1 are identical and the classes are combined.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. *Mon., Tu., Th., 2.20 to 4.20.*

[2.* *Histology and Physiology*]

Minute structure and special functions of plants, and their tissues; embryology; cytology; glycerin and paraffin technic, etc. The work of the third term can be arranged to meet the more special needs of students intending to take up either medicine or forestry. Certain portions of this course may, with the approval of the instructor, be continued by Juniors, Seniors, and Graduates, in course 6.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for 1, and for approved Graduates. Not offered in 1910–11. To be offered in 1911–12. Alternates with 3, 4, 5.

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‡ Students preparing for teaching or for botanical positions in the government or state experiment station service are advised to supplement courses 1, 2 and 3, 4, 5 with advanced or special work in course 6.

3, 4, 5. *Comparative Morphology*

Intended to give a general view of the evolution and classification of plants by a comparative study of the life-histories of certain types. First term, algae and fungi. Second term, mosses, ferns, etc. Third term, seed plants. Certain portions of this course may, with the approval of the instructor, be continued by Juniors, Seniors, and Graduates, in course 6.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for 1, and for approved Graduates. Not to be offered in 1911–12. Alternates with 2. *Mon., Wed., Fri., at 12.20.*

6.* *Special Course*

Arranged to meet the requirements of individual students. May be taken in successive years if previous work is not duplicated. Students electing this course should plan it definitely, in consultation with the instructor, before June 1 of the preceding academic year. Advanced, special, or research work upon almost any phase of botany may be chosen by students who are properly qualified.

One to three hours. Two to six hours of attendance. Through the year. Elective for Graduates and for approved Juniors and Seniors. Graduates may, with the consent of the instructor, elect the course for more than three hours.

7. *Trees*

Identification of native and introduced trees; characteristic structure of the more common kinds of wood. Lectures and field work. The required field trips will take place in the afternoon unless otherwise specially arranged, the number depending somewhat upon the length of the individual trips and the amount of work accomplished.

One hour. Two hours of attendance. Third term. Required in the Senior year of candidates for the degree of Bachelor of Science in Civil Engineering. Elective for Undergraduates. Lectures, *Wed. at 8.*

VI. CHEMISTRY

John Howard Appleton, A.M., Sc.D., *Newport-Rogers Professor of Chemistry*
John Emery Bucher, Ph.D., *Associate Professor of Organic Chemistry*
Robert Campbell Weed, Ph.B., *Instructor in Chemistry*
Moses Leverock Crossley, Ph.B., *Instructor in Chemistry*
Robert Foster Chambers, Ph.B., *Assistant in Chemistry*
Hovhannés Zovigian, Ph.B., *Assistant in Chemistry*

1, 2, 3. *Descriptive Chemistry*‡

Non-metals; metals, their metallurgy, compounds, and practical applications; theoretical chemistry. Lectures with experiments; written exercises; individual laboratory work. *Professor* Bucher, *Messrs.* Weed *and* Chambers.

Three hours. Through the year. Elective for Undergraduates. *1st div. Mon., Th., at 10.20; 2d div. Tu., Fri., at 10.20; 3d div. Wed., Sat., at 11.20.* Laboratory hours to be arranged with the instructor.

4, 5. *Qualitative Analysis*

First term, properties of the metallic elements; their separation from certain of their compounds. Laboratory work; recitations in qualitative analysis and in chemical philosophy; exercises in stoichiometry. Second term, the principal non-metals and the acids formed by them; methods of separation and recognition of acids and acid radicles. *Professor* Appleton *and Mr.* Crossley.

Three hours. Six hours of attendance. First and second terms. Elective for Juniors who have credit for 1, 2, 3.‡ *1st div. Fri. at 11.20; 2d div. Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

6. *Quantitative Analysis*

Quantitative precipitations and separations of the most important elements and compounds; the principles upon which quantitative apparatus is constructed; chemical philosophy and stoichiometry continued. Chiefly laboratory work. *Professor* APPLETON *and Mr.* CROSSLEY.

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‡ Credit for the entrance requirement in Chemistry admits only to 1, 2, 3, which may be taken also without previous preparation. Students who wish to enter more advanced courses without taking 1, 2, 3 must pass a special test at the time of the entrance examination in Chemistry. This test will cover the following topics: 1. All of the non-metals with their principal compounds and the processes of manufacture of the chief commercial products from non-metals. 2. About thirty important metals, their occurrence, preparation from the ore, the preparation and uses of their chief compounds. 3. The general principles of chemical action which depend upon physical laws. 4. Methods of making chemical computations of moderate difficulty.

Preparation for this test may require the equivalent of six hours a week for one school year.

Three hours. Six hours of attendance. Third term. Elective for Juniors who have credit for 4, 5. *1st div. Fri. at 11.20; 2d div. Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

7, 8, 9. *Quantitative Analysis, Advanced Course*

Assaying of metallic ores; analysis of agricultural materials; testing of chemicals used in textile establishments, etc. *Professor* APPLETON *and Mr.* CROSSLEY.

Six hours. Twelve hours of attendance. Through the year. Elective for Seniors and Graduates who have credit for 6. Laboratory hours to be arranged with the instructor.

10, 11, 12. *Organic Chemistry*

Preparation and analysis of representative organic compounds. Lectures, recitations, and laboratory work. *Professor* BUCHER *and Mr.* WEED.

Six hours. Through the year. First and second terms, three lectures a week and three laboratory periods a week. Elective for approved Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

13. *Assaying*

Professor APPLETON *and Mr.* CROSSLEY.

Six hours. Twelve hours of attendance. Third term. Elective for Seniors and Graduates who have credit for 1–6.

14. *Organic Dyes*

The chemistry and use of mordants, dyes, etc. *Professor* APPLETON *and Mr.* CROSSLEY.

Six hours. Twelve hours of attendance. Third term. Elective for approved Seniors and Graduates.

15, 16, 17. *Industrial Chemistry*

Lectures and laboratory work. *Professor* APPLETON.

Three to six hours. Six to twelve hours of attendance. Through the year. Elective for approved Graduates. Each term may be elected independently.

[18, 19, 20. *Physical Chemistry*]

Lectures and laboratory work. *Professor* BUCHER.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates. Not offered in 1910–11.

21, 22. *Organic Chemistry, Advanced Course*
Professor BUCHER.

Three hours. First and second terms. Elective for approved Graduates.

23. *Inorganic Chemistry, Advanced Course*
Professor BUCHER.

Three hours. Third term. Elective for approved Juniors, Seniors, and Graduates.

24, 25, 26. *Organic Preparations, Advanced Course*
Professor BUCHER.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

27, 28, 29. *Inorganic Preparations, Advanced Course*
Professor BUCHER.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates, who have credit for 10, 11, 12.

30, 31, 32. *Research Work in Chemistry*
Professor BUCHER.

Three hours or more. Through the year. Elective for Graduates.

33, 34, 35. *Conference on Special Topics in Chemistry*
Professor BUCHER.

One hour. Through the year. Elective for approved students.

36, 37, 38. *Conference on Special Topics in Chemistry*
Professor APPLETON.

One hour. Through the year. Elective for approved students.

41, 42, 43. *Industrial Chemistry and Research*
Professor APPLETON.

Three hours or more. Through the year. Elective for Graduates.

VII. CIVIL ENGINEERING‡

JOHN EDWARD HILL, C.E.M., Sc.D., *Professor of Civil Engineering*
ARTHUR HORACE BLANCHARD, C.E., A.M., *Associate Professor of Civil Engineering*
HENRY BERNARDIN DROWNE, C.E., *Instructor in Civil Engineering*

4, 5, 6. *Surveying, Elementary Course*

Theory and practice of plane surveying; use of tape, compass, level, and transit; adjustment of instruments. Lectures, recitations, field work, and drafting. *Professors* HILL *and* BLANCHARD, *Mr.* DROWNE.

Three hours. One hour of recitation and usually six hours of field work or drafting. Through the year. Elective for students who have credit for Mathematics 2 or 18, and for Mechanical Drawing 2 or 6. *Fri. at 2; Mon., Th., 2 to 5.*

7. *Topographical Drawing*

Pen topography; contour drawing; conventional signs. *Mr.* DROWNE.

One hour. Two hours of drafting. Second term. Not elective. *Wed. 2.20 to 4.20.*

8, 9. *Surveying, Advanced Course*

Topography; city surveying; use of stadia, plane table, and barometer; precise base-line measurements with steel tape. Methods as in 4, 5, 6. *Professors* HILL *and* BLANCHARD, *Mr.* DROWNE.

Three hours and two hours. Second term. Course 8 is taken during the spring recess. Elective for students who have credit for 4. *Wed., Fri., at 2.*

10, 11, 12, 13. *Railroad Engineering*

Theory, location, construction, and economics of railroad engineering. Lectures, recitations, field work, and drafting. Third term, railroad curves and practical problems. First term, actual location of a line about two miles long, map, and estimate of cost. Second term, railroad track and track work; maintenance of way department; economics of location. First term, earthwork and its cost; rock excavation; tunneling. *Professor* HILL *and Mr.* DROWNE.

Three, four (eight hours of field work), three, and three hours. Third, first, second, and first terms. Courses 10 and 11 are elective for students who have credit for Mathematics 2 or 18, and who have credit for or are taking 6. Courses 12 and 13 are elective for Juniors and Seniors. Third term, *Mon.,*

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‡ All the courses in this department except 16 are required of candidates for the degree of Bachelor of Science in Civil Engineering; all except 7 and 32 and 35 are elective for other students.

Th., Sat., at 8. First term, *Wed. 8 to 5.* Second term, *Tu., Wed., Sat., at 9.20.* First term, *Mon., Th., at 10.20; Fri. 3.20 to 5.20.*

14. *Hydraulic Engineering* ‡

Consideration of water supply mainly from a sanitary standpoint. A general course designed to give the chemical and biological aspects of water supply without laboratory work. Lectures, recitations, and seminary work. *Professor* HILL.

Three hours. Second term. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.20.*

15. *Geodesy*

Problems in geodetic surveying, with sufficient theory for a proper understanding of the formulae used. Lectures and computations. *Professor* HILL.

Three hours. One hour of recitation and five hours of computation. Third term. Elective for students who have credit for 6 and 9, and Astronomy 5. *Th. at 10.20 and 1.20 to 6.20.*

16. *Municipal Improvements*

Economic and social aspects of sewerage, water works, pavements, etc. *Professor* HILL.

Three hours. First term. Elective for Juniors and Seniors. Offered only if five or more elect the course. *Mon., Th., Fri., at 9.20.*

17. *Hydraulic Engineering* ‡

Consideration of water supply mainly from an engineering standpoint. Irrigation, pumps, and pumping machinery; construction of dams and reservoirs. Lectures, recitations, and seminary work. Supplements Mechanics 2, which gives the theoretical treatment of the subject. *Professor* HILL.

Four hours. Third term. Elective for students who have credit for Mechanics 2. *Mon., Wed., Fri., Sat., at 9.20.*

18. *Sanitary Engineering* ‡

Theory of sewerage, treatment and disposal of sewage; stream pollution; house drainage and its appliances; garbage collection and disposal. Lectures, recitations, and seminary work. *Professor* HILL.

Four hours. Third term. Elective for students who have credit for Mechanics 2. *Mon., Wed., Fri., Sat., at 10.20.*

‡ Courses 14, 17, and 18 cover the general subject of sanitation.

19. *Highway Engineering*

Economics, location, construction and maintenance of country roads; economics and design of street pavements; dust prevention and preservation of macadam roads; methods of testing road materials; roads and pavements in foreign countries. Lectures, recitations, inspection trips, and seminary work. *Professor* BLANCHARD.

Three hours. Third term. Elective for Sophomores, Juniors, and Seniors. *Mon., Tu., Th., at 8.*

23. *Simple Framed Structures*

The standard forms of simple roof trusses; calculation by analytical methods of stresses due to dead, snow, and wind loads; calculation by analytical methods of stresses in Pratt, Howe, Warren, and parabolic trusses due to dead, wind, uniform live, excess panel live, road roller, and locomotive wheel loads; miscellaneous trusses, skew bridges, cranes, trussed bents, and towers. Lectures, recitations, and seminary work. *Professor* BLANCHARD.

Three hours. First term. Elective for students who have credit for Mechanics 1 or 3. *Mon., Tu., Th., at 9.20.*

24. *Higher Framed Structures*

General analysis of continuous, movable, cantilever, and suspension bridges and three-hinged, two-hinged, and fixed-end arched ribs; calculations of stresses in continuous and non-continuous center-bearing swing bridges; theorem of three moments; deflection of framed structures; theorem of least work. Lectures, recitations, and seminary work. *Professor* BLANCHARD.

One hour. Third term. Elective for students who have credit for 23. *Th. at 10.20.*

25. *Elements of Structural Design*

Center of gravity and moment of inertia of combinations of structural shapes; riveted joints, tension members, compression members, combined direct and bending stresses, secondary stresses, columns under direct and eccentric loading; wooden structures; plate girder, pin-connected, and riveted Pratt truss bridges; construction of viaducts and elevated railroads; steel mill-building and high-building construction; comparison of standard structural specifications. Lectures, recitations, and computations. *Professor* BLANCHARD.

Three hours. First term. Elective for students who have credit for Mechanics 1 or 3. *Mon., Tu., Th., at 8.*

26. *Roof Design and Graphic Statics*

Graphic determination of center of gravity of combinations of structural shapes; determination by graphical methods of moments in beams and stresses in simple roof trusses; determination of shears, moments, and stresses in simply supported bridge trusses by the use of influence lines; complete design, with general drawings, of a fifty to seventy foot roof truss; inspection trips. *Mr.* DROWNE.

Three hours. One hour of recitation and four hours of drafting. First term. Elective for students who have credit for Mechanical Drawing 1 or 2, and have credit for or are taking 23 and 25. *Tu. 10.20 to 12.20 and 1.20 to 5.20; Wed. 2 to 5.*

27,‡ 28. *Bridge Design*

Determination of stresses in plate girders; design, with general drawings, of a plate girder highway bridge; design, with general drawings, of a Pratt truss railroad bridge. Lectures on American and English shop practice; the esthetic design of bridges, design of standpipes and elevated tanks, and American methods of erection of bridges and structures. Lectures, drawing, computations, inspection trips, and seminary work. *Professor* BLANCHARD *and Mr.* DROWNE.

Three hours. Six hours of drafting. Second and third terms. Elective for students who have credit for 26. Second term, *Tu., Th., 1.20 to 4.20.* Third term, *Tu. 10.20 to 12.20 and 1.20 to 5.20.*

29.‡ *Reinforced Concrete Structures*

Properties of reinforced concrete; theory and design of reinforced concrete arches in accordance with the elastic theory; theory and design of reinforced concrete beams, columns, retaining walls, dams, foundations, bridges, and culverts; systems of reinforcement; methods of construction; complete design, with drawings, of a fifty-foot reinforced concrete highway bridge; complete design, with drawings, of a reinforced concrete retaining wall. Lectures, recitations, drafting, and computations. *Professor* BLANCHARD.

Five hours. Three hours of recitation and four hours of drafting. Second term. Elective for students who have credit for Mechanics 1 or 3 and Mechanical Drawing 1 or 2. *Mon. 9.20; Tu., Th., 9.20 to 12.20.*

30.‡ *Masonry Structures*

Stone masonry; static and elastic theory of the masonry arch; design, with drawings, of a stone arch; theory and design of masonry piers, retaining walls, bridge abutments, and high masonry dams; complete design, with drawings, of a high masonry dam. Lectures, recitations, drafting, and computations. *Professor* BLANCHARD.

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‡ Courses 27, 29, 30 may not be elected separately.

Two hours. One hour of recitation and two hours of drafting. Second term. Elective for students who have credit for Mechanics 1 or 3 and Mechanical Drawing 1 or 2. *Mon. at 8 and 10.20 to 12.20.*

31. *Foundations*

Soundings and borings, foundation-beds, deposition of concrete under water, timber foundations, coffer dams, open caissons, Cushing cylinder piers, pile formulae, driving and foundations, pneumatic caissons of wood and steel, open dredging, the Poetsch freezing process, foundations in quicksand, foundations for high buildings. Lectures, recitations, and seminary work. *Professor* BLANCHARD.

Two hours. Second term. Elective for students who have credit for or are taking Mechanics 2. *Tu., Th., at 8.*

32. *Engineering Jurisprudence*

Essential elements of a contract, the parties to a contract, considerations, bids and bidders, work for private parties and public work. Employment of engineers, liability of the engineer as a professional man; when his functions are judicial; when he is a public officer. Real property, water rights, ownership, rights of way, boundaries, incorporeal rights, franchises, and patents. Engineering specifications and accompanying documents. Lectures and discussion of written decisions on typical cases assigned each week. *Professor* BLANCHARD.

Two hours. Third term. Required of candidates for the degree of Bachelor of Science. *Tu., Th., at 9.20.*

34. *Design of Sanitary Works*

Practical applications of the principles of design discussed in courses 17 and 18. Partial design of a sewerage system, water-works system, and filter plant. *Professor* HILL.

One hour. Two hours of drafting and computations. Third term. Elective for students who have credit for or are taking 17 and 18 and have credit for Mechanical Drawing 1 or 2. *Mon. 2.20 to 4.20.*

35. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Civil Engineering. The thesis must embody either a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

36. *Hydraulic Surveying*

Methods of surveying applicable to river and harbor work. Methods of measuring and rating the flow of streams. Actual measurement of the discharge of a stream by means of the current meter, weir, and floats. Recitations and field work. *Mr.* DROWNE.

Two hours. One hour of recitation and two hours of field work. Third term. Elective for students who have credit for 4 and 6 and have taken Mechanics 2. *Mon. at 8; Tu. 8 to 5.20.*

VIII. ECONOMICS‡

HENRY BRAYTON GARDNER, PH.D., *Professor of Economics*
WILLIAM KIRK, PH.D., *Assistant Professor of Economics*

1. *Elementary Economics*

Affords a general outline of the subject, and serves as an introduction to the more extended and special courses which follow. *Professor* GARDNER.

Three hours. First term. Sophomore, Junior, or Senior year. Required of candidates for the degree of Bachelor of Arts; elective for other students. *1st div. Tu., Fri., Sat., at 10.20; 2d div., Mon., Wed., Fri., at 12.20.*

2.* *General Economics*

The development and significance of the more important elements in the existing industrial organization; the principles governing the production, exchange, distribution, and consumption of wealth; the more important practical problems of economic life. Second and third terms, *Professor* GARDNER. First term, *Professor* KIRK.

Three hours. Through the year. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.20.*

[3. *Money and Banking*]

Principles of money and banking; recent monetary and banking history, particularly of the United States; monetary and banking systems of leading industrial nations; present monetary and banking problems. *Professor* GARDNER.

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‡ The courses in this department other than 1 are open only to those students who have credit for Economics 1, Political Science 1, and Social Science 1, which together constitute an introduction to the advanced work of the departments of Social and Political Science and Economics.

Three hours. First and second terms. Elective for Juniors, Seniors, and Graduates. Not offered in 1910–11. To be offered in 1911–12.

4. *Public Finance*

First term, general principles of public finance; revenues and expenditures of leading industrial nations. Second term, financial history of the United States. Third term, local finance; revenues, expenditures, and financial systems of American states and cities. *Professor* GARDNER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.* Not to be offered in 1911–12.

5. *History and Present Tendencies of Economics*

Early economic theories: a critical examination of the theories of the early schools of economists, especially the physiocrats and the early English school, with particular attention to the relation between economic thought and economic life and practice. Recent economic theories: a study of the tendencies of the historical school, the Austrian school, and recent English and American writers. The growth of the principle of monopoly, its influence on the production and distribution of wealth and on the economic well-being of society. *Professors* GARDNER *and* KIRK.

Three hours. One session of an hour and a half weekly. Through the year. Elective for Seniors and Graduates who have credit for 2. Hours to be arranged with the instructor.

6. *The Labor Movement*

History and analysis of the trade-union movement; growth of collective bargaining; labor problems in the United States. *Professor* KIRK.

Three hours. First term. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

7. *Socialism*

A brief review of the historically important socialistic schemes; mainly a study of the modern scientific socialism of Karl Marx and of the resulting socialistic movements. *Professor* KIRK.

Three hours. Second term. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

[8. *Industrial Corporations*]

Development of the corporate form of business organization; its effects; the problems to which it gives rise. Special emphasis on the recent movements toward combination, and toward state control of corporations, particularly quasi-public corporations. *Professor* GARDNER.

Three hours. Third term. Elective for Juniors, Seniors, and Graduates. Not offered in 1910–11. To be offered in 1911–12.

9. *The Tariff*

The arguments for free trade and protection in relation to the principles of international trade; the history of tariff legislation and its effects in the United States. *Professor* KIRK.

Three hours. Third term. Elective for Juniors, Seniors, and Graduates. Not to be offered in 1911–12.

[10, 11, 12, *Industrial History*]

First term, the chief stages in the development of the industrial life of England, with special emphasis on the origin and development of the existing form of industrial organization. Second term, the more important aspects of the industrial development of the colonies and the United States to 1860. Third term, the growth, organization, and geographical distribution of the main branches of industry since 1860; the relation of the industrial life of the United States to that of the world at large. *Professor* GARDNER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Not offered in 1910–11. To be offered in 1911–12.

13. *Economic and Commercial Geography*

A study of the physical features of the land; of climate, winds, ocean currents and their relation to man; of the geographical distribution of food-stuffs and raw materials of industry; and of the consequent development of commerce and of civilization in its economic aspects. Lectures and conferences. This course is the same as Geology 12. *Professors* BROWN *and* KIRK.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Wed., Th., at 10.20*. Conference hours to be arranged with the instructors.

14. *Statistics and Accounting*

First term, principles involved in the statistical method of investigating and presenting economic and social data with illustrations drawn from those classes of facts, *e.g.* the statistics of population, in connection with which this method has been most completely developed. Second term, the results and possibilities of the use of the statistical method in the observation of economic phenomena. Third term, the financial operations and statistics of corporations and the discussion of the general principles of accounting. *Professor* GARDNER.

Three hours. Through the year. Elective for Juniors, Seniors and Graduates. *Tu., Th., Sat., at 12.20.* Not to be offered in 1911–12.

20, 21, 22. *Investigation of Special Topics*

Intended to train the student in methods of gathering, handling, and presenting data in the study of economic life and problems. Laboratory methods. Students desiring to elect these courses must obtain the consent of Professor Gardner or Professor Kirk before the close of the academic year preceding that in which the course is to be taken. *Professors* GARDNER *and* KIRK.

Three hours. Six hours of attendance. Through the year. Elective for approved Juniors, Seniors, and Graduates. Each term may be elected independently.

IX. EDUCATION‡

WALTER BALLOU JACOBS, A.M., *Professor of the Theory and Practice of Education*

——————————, *Assistant in Education*

1. *History of Education*

Education among the early culture peoples as forming and perpetuating their civilization; the development of education in Greece and Rome as parallel to the development of thought and learning; early Christian education; the renaissance and humanism; the rise of realism in thought and education. The history of education considered from the point of view of the history of civilization.

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‡ Courses 1, 2, and 3 treat education in its relation to the individual and to the social and political whole; interest in them is therefore not limited to those who intend to teach. At the same time they form an introduction to the more advanced courses in Education. Those who intend to teach are advised to elect these courses during the Junior year.

Courses 1–6 cover the usual requirements for certificates of the First Grade except where practice teaching or experience is demanded. In Rhode Island a certificate is required of all teachers in schools supported in whole or in part by public money. Certificates of the First Grade are granted without examination to those who have completed courses 1–6 and hold a college degree. Due credit is also given for separate courses.

Certificates, authorizing the holders to teach in the evening schools of the state, are issued without examination to students who have completed three years of regular work, including Education 1–3.

Three hours. First term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

2. *Critical Study of Modern Education*

The beginnings of modern education; the naturalistic movement—Rousseau; the psychological movement—Pestalozzi, Froebel, Herbart; the scientific movement—Spencer; recent sociological tendencies; industrial education; the present status of higher education; problems which an adequate theory of education must solve.

Three hours. Second term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

3. *Fundamental Principles of Education*

The meaning and aim of education; the function of education as a social institution; the physical conditions of education; the aim of instruction; apperception; the choice and arrangement of studies; the principles of method; the use of the type in instruction; the training of the will; moral education.

Three hours. Third term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

4. *Psychology of Education*

Theory and process of mental development, with special emphasis upon the period of adolescence; psychology of method, and of the various studies and disciplines; ways in which student and teacher may utilize a knowledge of the more fundamental activities of the mind.

Three hours. First term. Elective for Seniors and Graduates who have credit for 1, 2, or 3, or who are taking 1. *Mon., Tu., Th., at 11.20.*

5. *Hygiene of Education*

A study of bodily growth and development; special emphasis upon the period of adolescence; play and fatigue; physical culture and athletics; arrested growth; the conditions and surroundings which favor or retard normal development; the hygiene of mind; school hygiene.

Three hours. Second term. Elective for Seniors and Graduates who have credit for 1, 2, or 3, or who are taking 2. *Mon., Tu., Th., at 11.20.*

6. *Practical Introduction to Teaching*

The method of the recitation; management and discipline of classes; observation of good teaching; practical applications of method.

Three hours. Third term. Elective for Seniors and Graduates who have taken or are taking other courses in Education. *Mon., Tu., Th., at 11.20.*

7, 8, 9. *Methods in Secondary School Studies and the Organization, Equipment, and Management of Secondary Schools*‡
Administration of secondary education; importance and meaning of secondary school studies; their organization into a curriculum; method as applied to each subject; the resources at the command of the teacher. The following studies receive special attention: first term, Latin and Modern Languages; second term, History and English; third term, Science and Mathematics.

Three hours. Two hours of class-room attendance. Through the year. Required of student-teachers. Elective for Graduates and experienced teachers. *Wed. 3.20 to 5.20.* Each term may be elected independently.

10, 11, 12. *Problems in Practical Teaching; Secondary Schools*‡
Practice teaching in the Providence High Schools under experienced teachers. Observation, reports, and conferences. Designed for those who wish to become instructors in colleges, teachers or principals in secondary schools, or superintendents of schools.

Three hours. Through the year. Elective for approved Graduates who have credit for elementary courses in Education and who are taking 7, 8, 9 and 16, 17, 18. *Fri. at 3.20*, and at other hours to be arranged.

13, 14, 15. *Problems in Practical Teaching; Grammar Grades*‡
Practice teaching in the Providence Grammar Schools under experienced teachers. Observation, reports, and conferences. Designed especially for those who wish to become grade teachers, principals of grammar schools, or superintendents of schools, but also for those who wish to teach in secondary schools. The following studies receive special attention: first term, Arithmetic; second term, Language; third term, History and Geography.

Three hours. Through the year. Elective for approved Graduates who have credit for elementary courses in Education and who are taking 16, 17, 18; also by special permission for a limited number of Seniors. *Mon. at 3.20*, and at other hours to be arranged.

16, 17, 18. *Seminary in Education*‡
Deals with those educational problems which are arousing discussion during the current year, social as well as institutional, elementary as well as advanced. Reviews of current publications, and studies of special topics assigned for presentation before the seminary. In these

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‡ In connection with this course, and for an explanation of the work of student-teachers, see the Catalogue, page 162.

assignments the needs and interests of individuals are considered. The course should be of special interest to experienced teachers, and advanced students of educational and social problems. As the subjects are not repeated, the course may be elected for successive years. For 1910–11 the subjects are: first term, Recent Contributions of Educational Psychology; second term, Social and Industrial Phases of Education; third term, The Administration of Education.

Three hours. Through the year. Two hours of class-room attendance. Required of student-teachers. Elective for Graduates and experienced teachers. *Sat. 10.20 to 12.20.* Each term may be elected independently.

X. ENGLISH ‡

WALTER COCHRANE BRONSON, A.M., LITT.D., *Professor of English Literature*

LINDSAY TODD DAMON, A.B., *Professor of Rhetoric*

ALBERT KNIGHT POTTER, A.M., *Associate Professor of the English Language*

GEORGE WYLLYS BENEDICT, PH.D., *Associate Professor of English*

THOMAS CROSBY, A.M., *Assistant Professor of English and Public Speaking*

HENRY BARRETT HUNTINGTON, A.B., *Assistant Professor of English*

HOWARD BRISTOL GROSE, JR.,† PH.B., *Instructor in English*

WILLIAM THOMSON HASTINGS, A.M., *Instructor in English*

STANLEY BATES HARKNESS, A.B., *Instructor in English*

LAWRENCE RICH GROSE, A.M., *Assistant in English*

____________________, *Assistant in English*

1. *Rhetoric and Composition*

Lectures and recitations upon the principles governing prose style, prescribed reading and themes. Designed to give the student a clear and correct style and some critical standards. *Professors* DAMON *and* BENEDICT, *Messrs.* HASTINGS, HARKNESS, GROSE, *and* ——.

Three hours. Through the year. Required of all Freshmen. *1st, 2d, 3d, and 4th div. Mon., Tu., Th., at 11.20; 5th, 6th, 7th, and 8th div. Mon., Wed., Fri., at*

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‡ Credit for English 1 is a prerequisite for admission to all other courses in the department. The requirement in English Literature for the degree of Bachelor of Arts may be satisfied by taking 10, 11, 14, 15, 19, or 20.

† On leave of absence during the academic year 1910–11.

12.20; 9th and 10th div. Tu., Th., Fri., at 3.20. Students repeating the course must enter division 8.

2.* *English Composition, Second Course*

Lectures, recitations, and prescribed reading; weekly themes and other written exercises. Intended to supplement the training given in 1, and to develop further the power of exact and lucid statement. *Mr.* HASTINGS.

Three hours. Through the year. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

3.* *English Composition, Advanced Course*

Frequent practice in composition and criticism. Intended to develop ease of style and clarity and vigor of thought. *Professor* BENEDICT.

Three hours. Through the year. Elective for Juniors and Seniors, and with the permission of the instructor for Sophomores who have attained the grade of C in 1. With the consent of the instructor the course may be repeated. *Mon., Tu., Th., at 2.20.*

4.* *Argumentative Composition*

Lectures on the principles and forms of argumentative composition; frequent practice in brief-drawing and the writing of forensics and less formal arguments. Intended to develop the power of handling argumentative topics cogently and persuasively. *Professor* HUNTINGTON.

Three hours. Through the year. Elective for Juniors and Seniors. *Mon., Wed., Th., at 10.20.*

5. *Argumentative Composition*

The principles and forms of brief-drawing and forensic writing. Lectures, written exercises, briefs, and forensics. Intended to furnish a more rapid training than 4, for students who wish to begin debate as early as possible or to go quickly over the fundamentals of argumentative composition. *Professor* HUNTINGTON.

Three hours. Two hours of attendance. First term. Elective for Juniors and Seniors. Not elective for students who have taken 4. *Mon. at 3.20; Fri. at 2.20.*

6.* *Debate*

Intended to train students in correct and vigorous oral presentation of ideas. *Professor* HUNTINGTON, *with the coöperation of the Professors of Economics, Social and Political Science, History, and Public Speaking.*

Three hours. Second and third terms. Elective for a limited number of Juniors and Seniors who have credit for 5 or for one or more terms of 4. With the consent of the instructor the course may be repeated. *Mon. 3.20 to 5.20; Fri. 2.20 to 4.20.*

7. *Public Speaking*

Principles of voice culture; vocal interpretation of literature; extempore speaking. *Professor* Crosby.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Wed., Fri., Sat., at 11.20.*

8. *Public Speaking, Advanced Course*

Practice in reading lyric, narrative, and dramatic literature, in extempore speaking, and in the composition and delivery of the common forms of the occasional address. Special attention to securing right tone-production and to improvement in speech. *Professor* Crosby.

Three hours. Through the year. Elective for students who have attained the grade of C in 7. *Mon., Tu., Th., at 11.20.*

9. *Old English*

Essentials of Anglo-Saxon grammar; prose selections; Béowulf. *Professor* Potter.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 4.20.*

10. *Chaucer*

Careful reading of most of Chaucer's works; study of Middle English grammar, with some attention to the development of Modern English. *Professor* Benedict.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 3.20.*

11. *English Literature from the Beginning to the Present Time*

An outline course in the history of English literature, with reading and study of the greater writers. *Professor* Bronson.

Three hours. Through the year. Elective for Sophomores. *Tu., Th., Sat., at 12.20.*

13. *History of the Drama in England*

The drama as a literary type and its history in England to 1642. *Professor* Potter.

Three hours. Two meetings a week and a third at the pleasure of the instructor. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. *Tu., Th., Sat., at 12.20.* Not to be offered in 1911–12.

[18. *The Modern English Drama*]

Preliminary study of Elizabethan plays; reading and study of the greater playwrights from 1642 to the present day.

Three hours. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. Not offered in 1910–11.

[14. *Shakspere*]

Careful study of a few plays with special attention to exact interpretation.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Not offered in 1910–11.

15. *Shakspere*

Shakspere as dramatist and poet; reading of all the plays. *Professor* POTTER.

Three hours. Through the year. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.20.*

16. *English Literature exclusive of the Drama, from 1600 to 1660*

The decline of the Elizabethan spirit; Puritanism and Anglicanism in literature; the "metaphysical" and mystical poets; the cavalier lyrists; all the English poems and some of the prose works of Milton. *Professor* BRONSON.

Three hours. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. *Mon., Wed., Fri., at 12.20.* Not to be offered in 1911–12.

17. *English Literature from 1660 to 1798*

The Restoration drama; the classical school; development of the essay and the novel; the beginnings of romanticism. *Professor* DAMON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for any one of the courses from 10 to 23 inclusive. *Mon., Tu., Th., at 11.20.* Not to be offered in 1911–12.

19. *English Literature from 1798 to 1832*

The romantic revolt in its critical and imaginative phases; influence of the French revolution; individualism in form and spirit. *Professor* HUNTINGTON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Wed., Sat., at 9.20.*

20. *English Literature from 1832 to 1892*

The Victorian period; modifications of romanticism in prose and poetry; realism; the influence of science and democracy; tendencies at the end of the century. *Professor* DAMON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon., Wed., Th., at 10.20.*

[22. *American Literature*]

American literature from the beginning, in its relation to American life and to English literature. *Professor* BRONSON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for 11, 19, or 20. Not offered in 1910–11.

23. *Seminary in English Literature*

Subject for 1910–11: Studies in the historical development of English lyrical and pastoral poetry. *Professor* BRONSON.

Three hours. Two hours of attendance. Through the year. Elective for Graduates, and for a limited number of Seniors who have attained the grade of C in two of the courses from 9 to 22 inclusive.

XI. GEOLOGY‡

CHARLES WILSON BROWN, A.M., *Assistant Professor of Geology*
NELSON CLARK DALE, A.M., *Assistant in Geology*
JAMES COOK MARTIN, PH.B., *Assistant in Geology*

3. *General Geology*

A discussion of the origin, weathering, and metamorphism of rocks;

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‡ Students who wish a general view of the geologic processes concerned in the development of the earth and its life should take course 3. Those who contemplate teaching physical geography should take also courses 12, 9, 8, 13. Students who desire to specialize in mining engineering, geology, or geography, in order to teach or to obtain appointment on government or state geological surveys, are advised to elect first the work in general geology and to follow it with courses 1, 11, 9, 8, 6, 12, 13, approximately in the order given.

of other agencies that have affected the formation and development of the earth and its crust; of certain land-forms and the stages of their development; a historical review of earth changes, with special reference to the development of the North American continent; the types of life characteristic of the periods of the past, and the principles of organic evolution they illustrate. Lectures, illustrated by models and lantern views. About one third of a term will be devoted to laboratory work. Two field trips will be taken in the first term and three in the third term. *Professor* BROWN, *Messrs.* DALE *and* MARTIN.

Three hours. Through the year. Elective for Undergraduates, except Sophomores who elect 1. *Tu., Fri., Sat., at 10.20.*

[6. *Dynamical and Structural Geology*]

An advanced course dealing with sedimentary formations old and new; with mineral veins, folds, faults, mountain-making, and other characteristics of crustal movements; and with the nature and results of igneous and metamorphic activities.

Three hours. One term. Offered if applied for. Elective for students who have credit for 3 or 16. Not offered in 1910–11.

1. *Mineralogy and Petrography*

Discussion of crystal forms and the laws of crystallography; the more common minerals and ores and their recognition and determination by their physical properties and by blow-pipe analysis; study of the optical properties of the rock-forming minerals under the polarizing microscope; the exact determination of rocks; a discussion of the fundamental principles of the origin and classification of rocks and ores. Lectures and laboratory work. *Professor* BROWN, *Messrs.* DALE *and* MARTIN.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores who do not elect 3, and for Juniors and Seniors. *Tu., Th., at 11.20.*

9, 8, 11. *Field Geology*

Geological maps, their use and methods of construction; practice in the actual working out of the surface geology and stratigraphy of an assigned definite area. Field work and reports.

Three hours. Through the year. One conference hour and the equivalent of six hours' work in the field-area. The first term may be taken independently and is elective for students who have credit for 3 or 16; the first and second terms may be elected as a two-term course; the third term may be elected independently by students who are taking 3 or 16.

17, 16. *Engineering Geology*

A discussion of the geologic processes and results that are closely related to engineering problems. Lectures, laboratory and field work. Two field trips in the first term and three in the third term are required, with detailed notes of the regions visited. *Professor* BROWN, *Messrs.* DALE *and* MARTIN.

Two hours (four hours of attendance), three hours. First and third terms. Required in the Junior year for the degree of Bachelor of Science in Civil Engineering. Not elective. *Tu. 9.20 to 11.20; Fri. 10.20 to 12.20; Mon., Wed., Fri., at 10.20.*

12. *Economic and Commercial Geography*

A study of the physical features of the land; of climate, winds, ocean currents and their relation to man; of the geographical distribution of food-stuffs and raw materials of industry; and of the consequent development of commerce and of civilization in its economic aspects. Lectures and conferences. This course is the same as Economics 13. *Professors* BROWN *and* KIRK.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Wed., Th., at 10.20*. Conference hours to be arranged with the instructors.

13. *Geographic Seminary*

Discussions and reports on advanced problems of geography. In 1910–11, the general topic will be the Geography of the Eastern Hemisphere.

Three hours. One hour of attendance. Through the year. By special arrangement with the instructor, the course may be taken for a shorter period. Elective for Graduates, for Undergraduates who have passed the first term's work in course 12, or an equivalent. *Sat. at 11.20.*

14. *Geologic Investigation*

Research work in the field and the laboratory, arranged to meet the needs of individual students.

Through the year. By special arrangement with the instructor, the course may be taken for a shorter period. Elective for qualified Graduates and for from one to six hours for approved Undergraduates.

15. *Conservation of Natural Resources*

A study of the conservation, utilization, and the prevention of the waste of natural resources, such as deposits of ores, fuels, road and building materials; soils, their reclamation by drainage, irrigation or other treatment; water resources, including the storage of surplus waters for water-supply and water-power, the relation between drainage, and rainfall and forestation; stream-erosion and deposition in relation to navigation; reservations for parks, game, forests and drainage basins.

Three hours. Second term. Elective for Juniors and Seniors who have credit for 3, 1, or 12. *Mon., Tu., Th., at 11.20.* Alternates with 6.

XII. GERMANIC LANGUAGES AND LITERATURES‡

CAMILLO VON KLENZE, PH.D., *Professor of the Germanic Languages and Literatures*

ASA CLINTON CROWELL, PH.D., *Associate Professor of the Germanic Languages and Literatures*

ROBERT MCBURNEY MITCHELL, A.B., *Instructor in German*

JOHN HENRY BACHMANN, A.M., *Instructor in German.*

1. *Introductory Course*

Reading, grammar, composition, conversation, dictation, sight reading. *Professor* CROWELL, *Messrs.* MITCHELL *and* BACHMANN.

Three hours. Through the year. Required of all students who did not present German for admission. *1st div. Tu., Wed., Sat., at 9.20; 2d div. Mon., Th., Fri., at 9.20; 3d div. Tu., Th., Sat., at 12.20; 4th div. Mon., Tu., Th., at 2.20.*

2. *Intermediate Course*

Reading of modern German stories of the type found in Batt and Allen's *German Stories,* volumes 1 and 2, lyrics (von Klenze or Hatfield), and one or two dramas of the classical period. Review of grammar; composition; conversation based upon the texts read. *Messrs.* MITCHELL *and* BACHMANN.

Three hours. Through the year. Required of all Freshmen who presented elementary German for admission. Not elective for students who have taken German in college. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Fri., Sat., at 10.20; 3d div. Mon., Wed., Th., at 10.20.*

3, 4, 5. *Reading Course*

Reading of modern German stories of the type found in Batt and

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‡ Students wishing recommendations from the department to teach German must pass a special examination designed to test their ability to write and to understand German, and, to some extent, to use the spoken language.

Allen's *German Stories,* volumes 1 and 2, lyrics (von Klenze or Hatfield), and two dramas illustrating respectively the classical and the modern period, for example, Schiller's *Maria Stuart* and Hebbel's *Agnes Bernauer.* Review of grammar; composition; conversation based upon the texts read. *Professor* CROWELL.

Three hours. Through the year. Elective for students who have credit for 1. *Mon., Wed., Th., at 10.20.*

6. *Modern Prose*

Aims to train the student in reading, speaking, writing, and understanding modern German. Reading of texts selected from fiction, history, and science; for example, Liliencron, Keller, Freytag, Helmholtz, Nichols's *Modern German Prose,* Paszkowski's *Lesebuch zur Einführung in die Kenntnis Deutschlands und seines geistigen Lebens,* 4th ed., and a text (such as Mosher's *Willkommen in Deutschland*) to introduce the student to the actual language of modern daily life. Talks in German; oral and written reports in German; letter-writing, composition, and conversation. *Professor* VON KLENZE *and Mr.* BACHMANN.

Three hours. Through the year. Elective for students who have credit for 1 or 2, or 3, 4, 5, who presented advanced German for admission. *Tu., Fri., Sat., at 10.20.*

7. *Advanced Course in Standard Authors, Classical and Modern*

One drama of Goethe or Schiller, one drama of Grillparzer, one drama of Hebbel, von Klenze's *Deutsche Gedichte,* Sudermann's *Frau Sorge.* Talks in German on the history of German literature; oral and written reports in German. *Mr.* MITCHELL.

Three hours. Through the year. Elective for students who have credit for 2, who presented advanced German for admission. *Mon., Tu., Th., at 11.20.*

[23, 24, 25. *German Lyrical Poetry*]

Introduces the student to the various aspects of the inner life of the German people as reflected in the lyrical poetry of the last two centuries. Lectures in German; oral and written reports in German.

Three hours. Through the year. Elective for students who have credit for 5 or 7, or who presented advanced German for admission; also for other approved students. Each term may be elected independently. Not offered in 1910–11.

26, 27, 28. *The German Short Story*

The development of the short-story into an art form. The study of the "Novelle" as represented by Kleist, Ludwig, Heyse, C. F. Meyer, Keller, and others, with frequent reference to the chief writers of the short-story of France, England, and America. Lectures and reports in German and English. *Professor* von Klenze.

Three hours. Through the year. Elective for students who have credit for 2, 5, or 6. *Wed., Fri., Sat., at 11.20.*

[29, 30, 31. *The German Drama of the Nineteenth Century*]

Kleist, Grillparzer, Hebbel, Hauptmann, and Sudermann. A study of the development of the German drama from waning romanticism to realism, with frequent reference to the chief representatives of the modern drama in other countries.

Three hours. Through the year. Elective for students who have credit for 5, 6, or 7. Each term may be elected independently. Not offered in 1910–11.

32. *Lessing and Schiller*

Aims to introduce the student to the dramatic theory and practice of German classicism. Reading of one or two of Lessing's dramatic works and of several of the representative dramas of Schiller, especially *Wallenstein.* Discussions of the dramatic principles of the Greek and the English drama and of their influence upon Lessing and Schiller, with references to the dramatic theories of the nineteenth century. Lectures and reports in German and English. *Professor* Crowell.

Three hours. Through the year. Elective for students who have credit for 5, 6, or 7. *Mon., Th., Fri., at 9.20.*

[10. *Goethe's Faust: Parts* 1 *and* 2]

With some notice of recent dramas of kindred interest. *Professor* Crowell.

Three hours. Through the year. Elective for students who have credit for 5 or 7. Not offered in 1910–11.

[33, 34, 35. *Goethe: A Study of His Life and Works*]

Lectures in German; reports on assigned topics; extensive reading. *Professor* von Klenze.

Three hours. Through the year. Elective for students who have credit for 7, 10, or 14. Not offered in 1910–11.

[12, 13, 14. *Outline History of German Literature*]

Aims to acquaint the student with the most important movements in the evolution of German literary life. Lectures in German; reports on assigned topics; extensive reading. *Professor* VON KLENZE.

Three hours. Through the year. Elective for students who have credit for 7 or 10. Not offered in 1910–11.

37, 38, 39. *German Literature in the Nineteenth Century*

A study of the literary life of Germany as an expression of German civilization in the nineteenth century. The literary output—Romantic School, Young Germany, Naturalism, Realism, Neo-Romanticism—will be studied, with frequent references to prominent literary personalities in other domains of intellectual life, such as David Friedrich Strauss, Mommsen, Nietzsche, Wagner, etc. *Professor* VON KLENZE.

Three hours. Through the year. Elective for students who have credit for 7, 10, 28, or 31. *Tu., Th., Sat., at 12.20.*

16. *Gothic and Old High German*

The Gothic language, with reading of extracts in Streitberg's *Gotisches Elementarbuch* or Braune's *Gotische Grammatik*, Braune's *Althochdeutsche Grammatik* and *Althochdeutsches Lesebuch. Professor* CROWELL.

Three hours. Through the year. Elective for Graduates. *Mon., Tu., Th., 3.20.*

[17. *Germanic Mythology*]

Primitive Germanic religion, customs, and ideas, in their relations to German literature. Discussions based on E. Mogk's *Germanische Mythologie. Professor* CROWELL.

One hour. Through the year. Elective for Juniors, Seniors, and Graduates. Not offered in 1910–11.

[20. *Old Norse*]

Holthausen's *Altisländisches Elementarbuch;* Wilken's *Prosaische Edda; Die Lieder der Edda,* edited by Sijmons and Gering. *Professor* CROWELL.

Two hours. Through the year. Elective for Graduates. Students electing Old Norse should also take Germanic Mythology. Not offered in 1910–11.

[15. *Middle High German*]

The language of the Middle High German period, including an introduction to Germanic philology. Michel's *Mittelhochdeutsches Elementarbuch; Das Nibelungenlied. Professor* VON KLENZE.

Three hours. Through the year. Elective for students who have credit for 7, 10, 14, or 16. Not offered in 1910–11.

36. *Seminary in German Literature*

Aims to give training in modern methods of investigation and criticism. To be conducted in German. *Professor* VON KLENZE.

Elective for approved students.

XIII. GREEK LITERATURE AND HISTORY ‡

JAMES IRVING MANATT, PH.D., LL.D., *Professor of Greek Literature and History*

FRANCIS GREENLEAF ALLINSON, † PH.D., *David Benedict Professor of Classical Philology*

ERNEST TROWBRIDGE PAINE, A.M., *Acting Assistant Professor of Greek*

A, B, C. *Elementary Course*

Designed to cover as much as possible of the entrance requirements in Greek, and thus to enable a student to take 1, 2, and 3 in the following year if he completes by private study before the opening of the first term the entire requirement in the *Anabasis,* and before the opening of the third term the entire requirement in Homer. *Professor* PAINE.

Three hours. Through the year. Elective for students who did not present elementary and advanced Greek for admission. *Tu., Th., Sat., at 12.20.*

3. *Lysias*

Selections from Lysias; selections for sight reading from Herodotus. *Professor* MANATT *and Professor* ALLINSON [this year *Professor* PAINE].

Three hours. First term. Elective for students who presented elementary and advanced Greek for admission, or who have credit for Greek A, B, C and have done the additional work indicated above. *Tu., Th., Sat., at 12.20.*

1. *Plato*

Plato's *Apology* and *Crito,* with selections from the *Phaedo. Professor* ALLINSON [this year *Professor* PAINE].

Three hours. Second term. Elective for students who have credit for 3. *Tu., Th., Sat., at 12.20.*

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‡ Courses 3, 1, 2 are a prerequisite for the more advanced courses in this department.

† On leave of absence during the academic year 1910–11.

2. *Homer*

The *Odyssey,* four books; rapid reading of other books; lectures on the life of the Heroic Age as revealed in the poems and illustrated by recent archaeological research. *Professor* MANATT.

Three hours. Third term. Elective for students who have credit for 1. *Tu., Th., Sat., at 12.20.*

35. *Greek Historians*

Selections from Herodotus, Thucydides, and Xenophon, with a general review of Greek History. *Professor* MANATT.

Three hours. First term. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

4. *Lucian*

Selected writings. *Professor* ALLINSON [this year *Professor* PAINE].

Three hours. Second term. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

6. *Dramatic Poets*

Lectures on the Greek drama. The *Prometheus* of Aeschylus; the *Oedipus Tyrannus* of Sophocles. *Professor* MANATT *or Professor* PAINE.

Three hours. Third term. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

[8. *Homer*]

Advanced course in the *Iliad* or the *Odyssey,* intended to serve as an introduction to prehistoric archaeology and as a preparation for teaching Homer. *Professor* MANATT.

Three hours. First term. Elective for Juniors and Seniors. Not offered in 1910–11.

[7. *Plato and Aeschylus*]

Republic, book X; selections from books I-IX; *Agamemnon. Professor* ALLINSON.

Three hours. Second term. Elective for Juniors and Seniors. Not offered in 1910–11.

[9. *Theocritus and Herondas*]

Twenty *Idylls* of Theocritus and selected *Mimes* of Herondas. *Professor* MANATT.

Three hours. Third term. Elective for Juniors and Seniors. Not offered in 1910–11.

[10. *The Drama*]

The *Medea* of Euripides and the *Frogs* of Aristophanes, with rapid reading of the *Seven against Thebes* of Aeschylus for literary criticism. *Professor* ALLINSON.

Three hours. Third term. Elective for Juniors and Seniors. Not offered in 1910–11.

11. *Herodotus*

A study of Greek history to the beginning of the Athenian Empire. Collateral reading of Aeschylus' *Persae;* and (in translation) Plutarch's *Solon, Themistocles,* and *Aristides. Professor* MANATT.

Three hours. First term. Elective for Juniors and Seniors.

12. *Thucydides*

The Rise and Fall of the Athenian Empire. Collateral reading of Aristophanes' *Acharnians* and *Knights;* and Plutarch's *Cimon, Pericles,* and *Alcibiades. Professor* MANATT *or Professor* PAINE.

Three hours. Second term. Elective for Juniors and Seniors.

[13. *Lucian*]

Advanced course. *Professor* ALLINSON.

Three hours. First term. Elective for Juniors and Seniors. Not offered in 1910–11.

[14. *Aeschines and Demosthenes*]

Speeches on the Crown; study of the Macedonian period and of Athenian political life. *Professor* MANATT.

Three hours. Second term. Elective for Juniors and Seniors. Not offered in 1910–11.

15. *Pindar*

Select Odes. *Professor* MANATT.

Three hours. Third term. Elective for Juniors and Seniors.

[16, 17, 18. *Homer*]

The *Odyssey;* portions of the *Iliad* and the *Hymns* in the original; the remainder of the poems in translation. *Professor* MANATT.

Three hours. Through the year. Elective for Juniors and Seniors. Not offered in 1910–11.

19, 20. *Greek Composition*

Professor PAINE.

One hour. Second and third terms. Elective for Sophomores, Juniors, and Seniors. *Fri. at 2.20.*

21, 22. *Modern Greek*

Introduction to the language; readings from living Greek authors and Greek newspapers. *Professor* MANATT.

One hour. Second and third terms. Elective for Sophomores, Juniors, and Seniors.

23, 24, 25. *Greek Seminary*

Subjects for 1910–11: Hesiod and the Homeric Hymns; the Greek Anthology; Isaeus and Greek historical inscriptions. *Professors* MANATT *and* PAINE.

One two-hour session weekly. Through the year. Elective for Graduates and approved Seniors.

[26. *Attic Orators*]

Professor MANATT.

Two hours. First term. Elective for Graduates and approved Seniors. Not offered in 1910–11.

[27, 28. *Homer and Mycenaean Archaeology*]

The Achillean books of the *Iliad* and the Ithacan books of the *Odyssey* studied in the light of recent archaeological discoveries. *Professor* MANATT.

Two hours. First and second terms. Elective for Graduates and approved Seniors. Not offered in 1910–11.

[29. *Demosthenes*]

Private speeches, selected to illustrate the workings of Athenian institutions. *Professor* MANATT.

Three hours. First term. Elective for Graduates. Not offered in 1910–11.

33. *Greek Life*

The private and public life of the Greeks studied in the light of their history, literature, and monuments. Manual, lectures, and prescribed reading, with frequent reports, written tests, and essays. No knowledge of Greek or Latin required. The course is continued in the second and third terms as Latin 28, 29. The three terms together constitute the course in the History of Greek and Roman Life and Institutions, which alternates with Greek 34, Latin 30, and Indo-European Philology 1. *Professors* MANATT *and* PAINE.

Three hours. First term. Elective for Freshmen and Sophomores. *Mon., Tu., Th., at 11.20.*

[34. *Greek Literature*]

A brief history of the literature of the Greeks from Homer to Theocritus, with study of the masterpieces in the best English translations. No knowledge of Greek or Latin required. The course is continued in the second and third terms as Latin 30 and Indo-European Philology 1. The three terms together constitute the course in Greek and Roman Literature and the History of Language, which alternates with Greek *33*, Latin *28*, *29*. *Professor* ALLINSON.

Three hours. First term. Elective for Freshmen and Sophomores. Not offered in 1910-11.

XIV. HISTORY ‡

WILLIAM MACDONALD, PH.D., LL.D., *George L. Littlefield Professor of American History*

WILFRED HAROLD MUNRO, A.M., *Professor of European History*

1. *Medieval and Modern History of Europe*

A general survey of the history of western Europe from the time of the barbarian invasions to the present. A narrative text-book supplemented by lectures, frequent written tests, and written reports and abstracts on assigned reading and topics for special investigation. *Professor* MACDONALD.

Three hours. Through the year. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy in either the Sophomore or the Junior year. *Mon., Tu., Th., at 2.20.*

2. *Spanish History*

Development of Spanish institutions, political and social; rise and greatness of Spain as a European power; its colonial system; its position with reference to the Reformation and the subsequent religious wars. *Professor* MUNRO.

Three hours. First term. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.20.*

3. *Islam and the Crusades*

Social and political conditions in Europe and the East at the beginning of the Crusades; organization and internal condition of Islam;

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‡ The elective courses in History are regularly open only to those who have credit for 1; but, by special permission of the instructor, elective courses, except 19, 20, 21, may be taken by Juniors who are at the same time taking 1.

effect of the Crusades on the thought, life, and political development of Europe. *Professor* Munro.

Three hours. Second term. Elective for Juniors, Seniors, and Graduates. ***Tu., Fri., Sat., at 10.20.***

4. *Period of the Renaissance*

Preparation for the Renaissance in the intellectual and social life of Europe; spread of the revival; connection between the Renaissance and the Reformation; artistic and literary aspects of the movement. *Professor* Munro.

Three hours. First term. Elective for Juniors, Seniors, and Graduates. ***Tu., Th., Sat., at 12.20.***

5. *Period of the Reformation*

Early movements of dissent from the Roman Church; the Protestant revolt in Germany, Switzerland, France, and England; the political and social aspects of the Reformation; the religious wars; the effect on religious belief and church organization. *Professor* Munro.

Three hours. Second term. Elective for Juniors, Seniors, and Graduates. ***Tu., Th., Sat., at 12.20.***

6. *The French Revolution*

Rise and progress of the Revolution in France; political and social conditions in Europe 1789–1815; permanent results of the Revolution, particularly its effect on political thought and practice. *Professor* Munro.

Three hours. Third term. Elective for Juniors, Seniors, and Graduates. ***Tu., Fri., Sat., at 10.20.***

7. *European History since 1815*

Political development of the more important states and their diplomatic relations; the revolutions of 1830 and 1848; the free-trade movement in England; the achievement of Italian unity; the founding of the German Empire; the Franco-Prussian war; the Eastern question, etc. *Professor* Munro.

Three hours. Third term. Elective for Juniors, Seniors, and Graduates. ***Tu., Th., Sat., at 12.20.***

[8, 9, 10. *English Constitutional and Political History to 1689*]

Formation of the English constitution; establishment and growth of the church; relations with Scotland and Ireland; the Reformation; the Puritan Revolution. *Professor* MUNRO.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. Not offered in 1910–11. To be offered in 1911–12.

11, 12, 13. *English Constitutional and Political History since 1689*

Foreign relations; the development of party government and the cabinet system; the social and political changes of the nineteenth century. *Professor* MUNRO.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each term may be elected independently. *Mon., Tu., Th., at 2.20.*

14, 15, 16. *Seminary in European History*

Discussion of assigned subjects, reports of reading and investigation, and similar exercises. *Professor* MUNRO.

Three hours. One hour of class-room attendance. Through the year. Elective for Graduates. Each term may be elected independently.

[19, 20, 21. *Constitutional and Political History of the United States*]

An advanced course covering the period from 1783 to the present time. Intended primarily for students who wish to specialize in American history or who expect to study law. *Professor* MACDONALD.

Three hours. Two meetings a week. Elective for Juniors, Seniors, and Graduates. Not offered in 1910–11. To be offered in 1911–12.

22, 23, 24. *Seminary in American History*

Designed to afford training in historical investigation and practice in the use of sources. The subjects vary from year to year, and are drawn from both the colonial and the constitutional periods. For 1910–11 the subjects are: First term, Social and industrial conditions in the United States during the Revolution. Second term, The Abolition movement. Third term, The South during Reconstruction.

Three hours. One to two hours of attendance. Through the year. Elective for Graduates and approved Seniors. The course should be preceded by 27, 28, 29, or 19, 20, 21, but by special permission it may be taken by students who have credit for 27, 28, 29, and are taking 19, 20, 21.

27, 28, 29. *American History*

A general course, covering the whole period from the beginnings of English colonization to the present time. Lectures, supplemented by assigned reading, study of the texts of representative documents, and special reports. Intended as an introduction to the advanced courses in American history, and for students who wish only a general survey of the subject or who expect to teach history. In 1910–11 special provision will be made in the second and third terms for students who wish to give particular attention to the constitutional aspects of the period. *Professor* MacDonald.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

25.* *Principles of Historical Criticism and Research*

The general principles of historical criticism and the literature of historical theory. *Professor* MacDonald.

One hour. One term. Elective for Graduates of one year's standing. Required of all candidates for the degree of Doctor of Philosophy in History.

XV. INDO-EUROPEAN PHILOLOGY

Francis Greenleaf Allinson,† Ph.D., *David Benedict Professor of Classical Philology*

[1. *General Introduction to the Study of Language*]

Outline of the history of language; the Indo-European family. Adapted for students of ancient or modern languages. A continuation of Greek 34, Latin 30. The three terms together constitute the course in Greek and Roman Literature and the History of Language.

Three hours. Third term. Elective for Freshmen and Sophomores. Not offered in 1910–11.

[4. *Seminary in Comparative Philology*]

For advanced students in Greek and Latin.

One two-hour session weekly. Third term. Elective for Graduates and approved Seniors. Not offered in 1910–11.

[7, 8, 9. *Sanskrit, Elementary Course*]

Whitney's *Grammar;* Lanman's *Reader;* selections from the *Vedic Hymns.*

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Not offered in 1910–11.

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† On leave of absence during the academic year 1910-11.

[10, 11, 12. *Sanskrit, Advanced Course*]

Vedic Hymns, and other selections.

One hour. Through the year. Elective for students who have credit for 7, 8, 9. Not offered in 1910–11.

XVI. MATHEMATICS‡

NATHANIEL FRENCH DAVIS, A.M., LL.D., *Professor of Pure Mathematics*

HENRY PARKER MANNING, PH.D., *Associate Professor of Pure Mathematics*

ROLAND GEORGE DWIGHT RICHARDSON, PH.D., *Assistant Professor of Pure Mathematics*

CLINTON HARVEY CURRIER,† A.M., *Instructor in Mathematics*

RAYMOND CLARE ARCHIBALD, PH.D., *Instructor in Mathematics*

FREDERICK WAHN BEAL, A.M., *Assistant in Mathematics*

____________________, *Assistant in Mathematics*

3. *Algebra*

Professors DAVIS *and* MANNING, *Messrs.* BEAL *and* ——.

Four hours. First term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Tu., Wed., Fri., Sat., one division at 8, the others at 9.20.*

1. *Solid and Spherical Geometry*

Professors DAVIS *and* MANNING, *Messrs.* BEAL *and* ——.

Four hours. Second term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Tu., Wed., Fri., Sat., one division at 8, the others at 9.20.*

2. *Trigonometry*

Professors MANNING *and* RICHARDSON, *Messrs.* BEAL *and* ——.

Four hours. Third term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented only Plane Geometry for admission. *Tu., Wed., Fri., Sat., one division at 8, the others at 9.20.*

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‡ The Undergraduate courses 1–11 should be taken in the order in which they are printed. Courses 17–21 are designed for students who are taking or who intend to take engineering courses. Courses 22–28 are designed for Graduates: two or three of these courses are offered each year according to the needs of the students. For those who have taken all of them, other courses can usually be arranged.

† On leave of absence during the academic year 1910–11.

4. *Analytic Geometry*

Professor Davis *and Mr.* Beal.

Three hours. First and second terms. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. Elective for students who have credit for 3, 1, 2. *Mon., Wed., Fri., at 12.20.*

5. *Differential and Integral Calculus*

Professor Davis *and Mr.* Beal.

Three hours. Third term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. Elective for students who have credit for 4. *Mon., Wed., Fri., at 12.20.*

6, 7, 8. *Differential and Integral Calculus*

A continuation of 5. *Professors* Davis *and* Richardson.

Three hours. Through the year. Elective for students who have credit for 5. *Tu., Th., Sat., at 12.20.*

9, 10, 11. *Differential Equations*

Professor Manning.

Three hours. Through the year. Elective for students who have credit for 6 or 21. First term required of candidates for the degree of Bachelor of Science in Electrical Engineering. *Tu., Th., Sat., at 12.20.*

15. *Spherical Trigonometry*

Mr. Beal.

One hour. First term. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. Elective for students who have credit for 2 and who have not taken Spherical Trigonometry. *Mon., Th., at 9.20.*

16. *Algebra*

Mr. Beal.

One hour, first term. Two hours, second and third terms. Required of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission. *Mon., Th., at 9.20.*

17. *Algebra*

Professor Richardson, *Dr.* Archibald, *and Mr.* Beal.

Six hours. First term. Required of candidates for the degree of Bachelor of

Science. *Mon., Tu., Wed., Th., Fri., Sat., one division at 12.20, the others at 11.20.*

18. *Plane and Spherical Trigonometry*

Professor Richardson, *Dr.* Archibald *and Mr.* Beal.

Six hours. Second term. Required of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., one division at 12.20, the others at 11.20.*

19. *Analytic Geometry*

Professor Davis, *Dr.* Archibald *and Mr.* Beal.

Six hours. Third term. Required of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., one division at 12.20, the others at 11.20.*

20. *Differential Calculus*

Professors Davis *and* Richardson.

Five hours. First term. Required of candidates for the degree of Bachelor of Science. *One division, Tu., Wed., Th., Fri., Sat., at 9.20. One division, Mon., Th., at 8; Tu., Fri., Sat., at 10.20.*

21. *Integral Calculus*

Professors Davis *and* Richardson.

Three hours. Second and third terms. Required of candidates for the degree of Bachelor of Science. *One division, Tu., Wed., Sat., at 9.20. One division, Tu., Fri., Sat., at 10.20.*

[22. *Function Theory of a Complex Variable*]

Professor Manning.

Three hours. Through the year. Elective for Graduates and approved Seniors. Not offered in 1910–11.

23. *Differential Equations, Advanced Course*

Professor Manning.

Three hours. Through the year. Elective for Graduates who have credit for 22.

[24. *Advanced Algebra*]

Professor Richardson.

Three hours. Through the year. Elective for Graduates and approved Seniors. Not offered in 1910–11.

27. *Projective Geometry*

Dr. Archibald.

Three hours. Through the year. Elective for Graduates and approved Seniors.

28. *Function Theory of a Real Variable*

Professor Richardson.

Three hours. Through the year. Elective by special permission of instructor.

XVII. MECHANICAL ENGINEERING[‡]

William Herbert Kenerson, M.E., A.M., *Associate Professor of Mechanical Engineering*

Thurston Mason Phetteplace, Ph.B., M.E., *Assistant Professor of Mechanical Engineering*

Henry Dewees Cady, *Instructor in Shop Practice*

George Thomas Huxford, Sc.B., *Assistant in Mechanical Engineering*

1, 2. *Wood-work*

Exercises in carpentry, wood-turning, and pattern-making. Reference reading and presentation of papers. *Mr.* Cady.

Three hours in any term. Seven hours of attendance. Elective for Sophomores, Juniors, and Seniors, who have had instruction in drawing.

3, 4, 5, 6. *Metal-work*

Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. Reference reading and presentation of papers. *Mr.* Cady.

Three hours in any term. Seven hours of attendance. Elective for Sophomores, Juniors, and Seniors, who have had instruction in drawing. *Wed. 2.20 to 5.20; Fri. 2.20 to 6.20.*

8. *Kinematics*

Velocity ratios, rolling surfaces, cams, and belting. Recitations, drawing, and the solution of problems. *Professor* Phetteplace.

Three hours. Seven hours of attendance. Third term. Elective for students who have credit for Mechanical Drawing 5. *Tu. 12.20 to 1.20, 2.20 to 5.20; Fri. 2.20 to 5.20.*

[‡] All the courses in this department are required of candidates for the degree of Bachelor of Science in Mechanical Engineering. Courses 1–6 are all elective for Sophomores, Juniors, and Seniors, but not more than two of them may be counted towards the degree of Bachelor of Arts or Bachelor of Philosophy.

9, 10, 11. *Kinematics*

Gearing, linkwork, parallel motions, and gear trains; machine tools; the application of the principles involved. Recitations, drawing, and the solution of problems. *Professor* PHETTEPLACE.

Three hours. Seven hours of attendance. Through the year. Elective for students who have credit for 8 and for Mechanical Drawing 5. *Mon. 2 to 6; Th. 2.20 to 5.20.*

12, 13, 14, 15. *Machine Design*

Applications of the principles of mechanics and the strength of materials to the design of representative types of boilers, engines, and various mechanisms; solution of problems illustrating the method of designing bolts and nuts, keys, journals and bearings, fly-wheels, valve gears, etc. Lectures, calculation, and drawing. *Professor* PHETTEPLACE.

Three hours. Six hours of attendance. First, second, third, and third terms. Elective for students who have credit for 8, 9, 10, 11 and Mechanics 1. *Mon., Th., 10.20 to 1.20.*

16, 17, 18. *Thermodynamics*

Applications of the principles of gases and vapors to steam, gas, and other heat engines, air-compressors, refrigerating apparatus, etc.; discussion of the energy of fuel and the utilization of such energy for power purposes by means of various media; laws of the relation of variations of pressure, temperature, and volume of such media; analysis of the various cycles used in heat engines; the principles of the injector and the ejector. *Professor* KENERSON *and Mr.* HUXFORD.

Three hours. Through the year. Elective for students who have credit for Physics 1, 2, 3. *Tu., Wed., Sat., at 9.20.*

19, 20, 21. *Engineering Practice*

Applications of the principles of thermodynamics and mechanics to the production, transmission, utilization, and measurement of power; valves and valve gears, and valve setting; indicator practice and tests of various forms of steam engines, gas engines, etc.; standardization of auxiliary apparatus used in making the various tests; boiler testing; flue gas and fuel analysis, etc. Lectures, recitations, and laboratory work. *Professor* KENERSON *and Mr.* HUXFORD.

Three hours. Through the year. Elective for students who have taken or are taking 16, 17, 18. *Tu., Fri., Sat., at 11.20; Tu. 2.20 to 4.20.*

22. *Materials of Engineering*

Study of the sources, manufacture, and properties of the important materials used in engineering; laboratory tests to determine the behavior of materials when subjected to tensile, compressive, and torsional stresses; mixing and testing of cements and mortars; preparation and examination of sections for the microscopical study of the structure of metals and alloys. Lectures, recitations, and laboratory work. *Professor* KENERSON *and Mr.* HUXFORD.

Three hours. First and second terms. Elective for students who have taken Mechanics 3. *Wed., Fri., at 10.20. 1st div. Mon., 2.20 to 4.20; 2d div. Tu., 2.20 to 4.20; 3d div. Th., 2.20 to 4.20; 4th div. Mon., 9.20 to 11.20.*

23. *Power Plant Engineering*

Discussion of the relation and coördination of the various parts of the complete power plant; management, and methods of determining efficiency; selection of the best equipment from manufacturers' catalogues and actual inspection. Lectures, recitations, tests, and tours of inspection. *Professor* PHETTEPLACE.

Three hours. First term. Elective for students who have credit for 19, 20, 21. *Wed., Fri., 2.20 to 5.20.*

24. *Advanced Laboratory Course*

Investigation of special problems in hydraulic and steam engineering. Determination of experimental constants for the Venturi meter, flow of water over weirs and through pipes, flow of air, steam, etc. Particular emphasis laid on preparation and form of reports. *Professor* KENERSON *and Mr.* HUXFORD.

Three hours. Second term. *Wed., Fri., 2 to 5.*

25. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Mechanical Engineering. The thesis must embody a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XVIII. MECHANICS AND MECHANICAL DRAWING

Otis Everett Randall, Ph.D., *Professor of Mechanics and Mechanical Drawing*

Ansel Brooks, Ph.B., M.E., *Associate Professor of Mechanics and Mechanical Drawing*

John Joseph Long, Ph.B., *Instructor in Mechanical Drawing*

MECHANICS

1. *Mechanics of Solids*

Statics, including resolution and composition of forces, determination of center of gravity, and problems relative to rigid bodies and flexible cords; dynamics, including rectilinear and curvilinear motion, virtual velocity, moment of inertia, work, energy and power, and friction; strength of materials, including tension, compression, shearing, torsion, flexure, and arches; methods of graphical solution of problems. *Professors* Randall *and* Brooks.

Three hours. Through the year. Elective for students who have credit for Mathematics 4 and 5, and who have taken or are taking Mathematics 6. First and second terms required of all candidates for the degree of Bachelor of Science. *Mon., Tu., Th., at 11.20.*

3. *Strength of Materials*

Tension, compression, shearing, torsion, flexure, arches, and graphical solution of problems. *Professors* Randall *and* Brooks.

Six hours. Third term. Required of all candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., at 11.20.*

2. *Mechanics of Fluids*

Hydrostatics; nature and use of instruments; flow through orifices, over weirs, through tubes, through pipes, in conduits, flow of rivers, water supply and water power, dynamic pressure of water, water wheels, turbines, pumps and pumping. *Professor* Randall.

Three hours. First and second terms. Required of all candidates for the degree of Bachelor of Science. Elective for students who have credit for 3. *Wed., Fri., Sat., at 11.20.*

4. *Advanced Mechanics*

Comprehensive treatment of the principles of kinematics, statics, and kinetics; strength of materials; higher theoretical and practical problems. *Professor* Randall.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 3.

MECHANICAL DRAWING

6. *Elementary Mechanical Drawing*

Nature, care, and use of drafting instruments; lettering; plane problem construction; curve tracing; elementary projection. *Professor* BROOKS *and Mr.* LONG.

Two hours. Four hours of drawing. Through the year. Required in the Freshman year of candidates for the degree of Bachelor of Science. *Tu., Fri., 2.20 to 4.20; Wed. 2 to 6.*

1. *Descriptive Geometry*

Discussion, proof, and graphic solution of problems relating to the point, line, and plane, line and surface generation and classification, surface tangency, intersections and developments; application of the principles of descriptive geometry in isometric drawing, shades and shadows and perspective, machine drawing, and practical engineering problems. *Professors* RANDALL *and* BROOKS, *Mr.* LONG.

Three hours. Two hours of recitation and three hours of drawing. Through the year. Required in the Sophomore year of candidates for the degree of Bachelor of Science. Elective for students who have credit for 2 or 6. *Mon., Tu., Wed., Th., Fri., Sat., at 9.20; Tu., Fri., Sat., at 10.20.*

2. *Elementary Mechanical Drawing*

Nature, care, and use of drafting instruments; plane problem construction; theory of orthographic and isometric projection. *Professor* BROOKS *and Mr.* LONG.

Three hours. Six hours of drawing. First term. Elective for Freshmen who are candidates for the degree of Bachelor of Philosophy, and for all Sophomores, Juniors, and Seniors. *Mon., Wed., Th., at 10.20.*

3. *Descriptive Geometry*

Discussion, proof, and graphic solution of problems in descriptive geometry. *Professor* BROOKS *and Mr.* LONG.

Three hours. Two hours of recitation and two hours of drawing. Second and third terms. Elective for Freshmen who are candidates for the degree of Bachelor of Philosophy, and for Sophomores, Juniors, and Seniors who have credit for 2. *Mon., Wed., Th., at 10.20.*

4, 5. *Machine Drawing*

Study and representation of machine parts; the principles of elementary machine design; sketches, detail and assembly drawings of machines; practice in reading drawings. *Professor* Brooks *and Mr.* Long.

Three hours. One hour of recitation and eight hours of drawing. First and second terms. Required of candidates for the degree of Bachelor of Science in Mechanical Engineering or Electrical Engineering. Elective for students who have credit for 3. *Tu. at 12.20; Mon., Th., 2.20 to 5.20.*

8. *Practical Mechanical Drawing*

Intersections and developments; third quadrant projection; sketching and dimensioning; conventional methods of representing machine parts; detailing and assembling; exercises in reading drawings; architectural drawing, including the drawing of plans and elevations and the details of building construction. For students desiring to continue their course in drawing without taking the theoretical work of descriptive geometry. *Professor* Brooks *and Mr.* Long.

Three hours. Six hours of drawing. Second and third terms. Elective for students who have credit for 2. *Mon., Wed., Th., at 10.20.*

XIX. PHILOSOPHY

William Herbert Perry Faunce, A.M., D.D., LL.D., *Professor of Moral and Intellectual Philosophy*

Edmund Burke Delabarre, Ph.D., *Professor of Psychology*

Walter Goodnow Everett, Ph.D., *Professor of Philosophy and Natural Theology*

Alexander Meiklejohn, Ph.D., *Professor of Logic and Metaphysics*

Arthur Upham Pope, A.M., *Instructor in Philosophy*

1. *Logic*

Aims, methods, and limitations of human thinking; a preparation for work in the sciences and in philosophy. First term, general introduction and formal logic. Second term, principles and methods of the natural sciences. Third term, relations of science to philosophy; philosophical interpretation and criticism of the results of science. *Professor* Meiklejohn *and Mr.* Pope.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon., Th., Fri., at 9.20.*

2. *Psychology, Introductory Course*

The main facts and laws of mental life, with particular attention to their arrangement in a scientific system. The course aims to provide a sound foundation for further acquaintance with this and allied subjects, for an improved judgment in dealing with many practical problems of life, and for beginning the study of philosophy. *Professor* DELABARRE.

Three hours. Through the year. Elective for Juniors and Seniors. *Wed., Fri. Sat., at 11.20.*

3. *Psychology, Advanced Course*

A seminary for the discussion of important and interesting questions in psychology. The course may be extended over several years if desired. In the first year are usually studied the problems of mental composition, of the relation of mind and body, and of the criteria for accepting evidence for the more unusual or apparently marvelous phenomena to which the name psychical research is ordinarily applied. Special problems for study are arranged with individual students who desire to pursue the subject for a longer period, or who have had more than one year of previous preparation. *Professor* DELABARRE.

Three hours. Through the year. Elective for Undergraduates and Graduates who have taken 2, or its equivalent.

4. *Experimental Psychology, Introductory Laboratory Course*

Description of the main lines and results of experimental research; demonstrations by the instructor or the class; training in the use of apparatus and in careful scientific observation and measurement. *Professor* DELABARRE.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates, who have taken or are taking 2. Although essentially a year course, it may, by special arrangement with the instructor, be taken for a shorter period.

5. *Experimental Psychology, Advanced Laboratory Course*

The aim is to study further the problems of experimental psychology, and, whenever possible, to make original contributions to scientific knowledge. The problems investigated vary and the course may be taken two or more years in succession. *Professor* DELABARRE.

One to six hours. Two to twelve hours of attendance. Through the year. Elective for students who have credit for 4. May be taken for more than six hours by Graduates.

6, 7, 8. *History of Philosophy*

The successive philosophical systems in their dialectical development and mutual relations; treatment not merely analytic and historical, but synthetic and constructive as well. First term, Greek philosophy. Second term, medieval and early modern philosophy. Third term, recent and contemporary philosophy. *Professor* EVERETT.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

9, 10. *Theoretical Ethics*

Intended to aid in mastering the fundamental problems of life and character. First term, a discussion of the nature and relations of ethics and an outline of the history of the chief ethical systems. Second term, a critical study of the fundamental concepts of ethics with the aim of constructing a tenable theory of conduct. *Professor* EVERETT.

Three hours. First and second terms. Elective for Juniors, Seniors, and Graduates. *Tu., Wed., Sat., at 9.20.*

12. *Philosophy of Religion*

A study of the nature of the religious consciousness and of the ultimate problems of religious belief. *Professor* EVERETT.

Three hours. Third term. Elective for Seniors and Graduates who have credit for one course in Philosophy. *Tu., Wed., Sat., at 9.20.*

13, 14, 15. *Philosophical Seminary*

Lectures, written reports, and discussions on the more difficult problems of philosophy. Subject for 1910–11 to be announced later. *Professor* EVERETT.

Three hours. Through the year. Elective for Graduates.

[16. *Kantian and Post-Kantian Philosophy*]

Kant's *Critique of Pure Reason* studied as a source of modern philosophical theories. *Professor* MEIKLEJOHN.

Three hours. Through the year. Elective for Seniors who have credit for 6, 7, 8, and for Graduates. Not offered in 1910–11.

17. *Metaphysics*

A seminary for the discussion of special problems in metaphysical theory. Reading, written reports, and discussions. *Professor* MEIKLEJOHN.

Three hours. Through the year. Elective for Seniors who have credit for 6, 7, 8, and for Graduates.

XX. PHYSICS

Carl Barus, Ph.D., LL.D., *Hazard Professor of Physics*
Albert deForest Palmer, Jr., Ph.D., *Associate Professor of Physics*
Arthur Eugene Watson, Ph.D., *Assistant Professor of Physics*
Robert Franklin Field, A.M., *Assistant in Physics*

1, 2, 3. *Elementary Physics*‡§

First term, kinematics and dynamics. Second term, molecular physics. Third term, electricity. Lectures, illustrated by experiments and the lantern; weekly written exercises corrected in detail by the instructors. Designed for those who have had little previous training in physics. *Professor* Barus.

Three hours. Through the year. Elective for Undergraduates who have credit for Mathematics 1, 2, 3. *Mon., Wed., Th., at 10.20.*

4, 5, 6. *Elementary Physics, continued*‡§

First term, optics. Second term, acoustics, polarization of light. Third term, heat. Methods as in 1, 2, 3. *Professor* Barus.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors, who have credit for 1, 2, 3. *Tu., Fri., Sat., at 10.20.*

7. *Physical Measurements*§

Elementary theory and practice of physical manipulation. Reports of experiments and solution of problems. *Professor* Palmer *and Mr.* Field.

Three hours. Six hours in the laboratory. Through the year. Elective for students who have credit for 1, 2, 3, or 4, 5, 6.

8, 9, 10. *Mathematical Treatment of Dynamical Problems*‖

Lectures. First term, discussion of the general principles of dynamics and the development of the general equations of motion. Second and third terms, application of these principles to special problems in thermodynamics and hydrodynamics. *Professor* Palmer.

‡ Graduates taking courses 1, 2, 3, 4, 5, 6 are held responsible for all the demonstrations, or for the full equivalent of either Watson's or Daniel's *Principles of General Physics.*

§ Students who intend to teach physics should elect courses 1, 2, 3; 4, 5, 6; 7.

‖ In determining which of the two courses 8, 9, 10 and 11, 12, 13 shall be offered in any given year, the preference of applicants will be considered.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 7 and Mathematics 9.

11, 12, 13. *Mathematical Theory of Electricity and Magnetism*‡

Lectures. Includes a discussion of the more important problems of electrical science. *Professor* PALMER.

Three hours. Through the year. Elective for Graduates and Seniors who have credit for 7 and Mathematics 9.

14, 15, 16. *Advanced Laboratory Course*

Special problems and reference to original sources for methods of solution. *Professors* BARUS, PALMER, *and* WATSON.

Three or six hours. Six or twelve hours of attendance. Through the year. Elective for students who have credit for 7.

17, 18, 19. *Applied Harmonic Analysis and Applied Vector Analysis*§

Importance of Fourier's method shown by examples drawn from the analytical theory of heat, from elastics, alternating electricity, and elsewhere; treatment by the aid of spherical harmonics, Bessel functions, and Lamé functions; the chief theorems of vector analysis deduced and applied to dynamics, elastics, hydrodynamics, the electromagnetics of Maxwell and Hertz, and the electronic theory of Heaviside, Lorentz, and others. *Professor* BARUS.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 1, 2, 3 and Mathematics 6, 7, 8.

20, 21, 22. *Physics, Advanced Course*§

Lectures on dynamics, potential, elastics, hydrostatics, hydrodynamics, viscosity, capillarity, electrostatics, magnetism, electro-magnetism, thermo-electrics, induction, Fresnel's optics, the electromagnetic theory of light, thermal analytics, and thermodynamics. Completed in two years. *Professor* BARUS.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for Mathematics 6, 7, 8.

23. *Precision Measurements in Photometry, Electricity, and Magnetism*

Professor PALMER.

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‡ In determining which of the two courses 8, 9, 10 and 11, 12, 13 shall be offered in any given year, the preference of applicants will be considered.

§ In determining which of the two courses 17, 18, 19 and 20, 21, 22 shall be offered in any given year, the preference of applicants will be considered.

Three hours. Six hours in the laboratory. Through the year. Elective for students who have credit for 7 or 24 and Mathematics 6.

24. *Theory of Measurements*

Lectures and recitations on the theory and precision of measurements and on methods of taking, recording, and reducing observations; laboratory instruction in selected physical measurements. *Professor* PALMER *and Mr.* FIELD.

Three hours. Five hours of attendance. Through the year. Elective for students who have credit for 1, 2, 3 or 4, 5, 6 and Mathematics 6 or 21. *1st div. Mon., Tu., at 12.20; 2d div. Mon., Th., at 12.20.* Laboratory hours will be posted in 11 Wilson Hall on the first day of each term.

ELECTRICAL ENGINEERING‡

Professor WATSON *and Mr.* FIELD

1, 2, 3. *General Course*

Methods of generating and utilizing electric currents, theory and working of dynamo-electric machinery.

Three hours. Elective for students who have taken or are taking Physics 7 or 24 and Mathematics 5 or 20. Those taking the course through the year attend two hours of lecture or recitation and one period (two hours) in the laboratory per week. For those taking but two terms, the laboratory practice is confined to one period in the second term. *Mon., Th., Fri., at 9.20;* laboratory assignments to be arranged with the instructor.

4, 5, 6. *Alternating Currents*

Mathematical and graphical treatment.

Three hours. Two hours of recitation and two hours of laboratory work. Through the year. Elective for students who have credit for 3 and who have taken or are taking Mathematics 9. *Mon., Th., at 10.20;* one laboratory period.

7, 8, 9. *Industrial Electricity*

First term, telephone and telegraph engineering. Second term, history of electrical engineering. Third term, design and calculation of direct current machinery, including actual drawing of electrical machinery in connection with Mechanical Engineering 11.

Three hours. Through the year. To be taken with 1, 2, 3. Not elective. First term, *Tu., Wed., Sat., at 9.20.* Second and third terms, *Tu., Wed., Fri., at 9.20.*

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‡ All the courses in this department are required of candidates for the degree of Bachelor of Science in Electrical Engineering. Courses 1, 2, 3 are required of candidates for the degree of Bachelor of Science in Mechanical Engineering. Courses 1 and 2 are required of candidates for the degree of Bachelor of Science in Civil Engineering.

11. *Alternating Current Machinery*

Design and calculation of generators, motors, transformers, etc.

Three hours. Second term. Must be taken with 12. Elective for students who have credit for 1, 2, 3. *Mon., Th., Fri., at 9.20.*

12. *Power and Lighting Stations*

Equipment and systems of distribution.

Three hours. Second term. Must be taken with 11. Elective for students who have credit for 1, 2, 3. *Tu., Fri., at 11.20,* and a third period for trips of inspection or special assignments of work.

13. *Specific Electrical Engineering Problems*

Reading and discussion. Seminary method.

Three hours. Third term. Not elective. *Tu., Wed., Fri., at 10.20.*

14. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Electrical Engineering. The thesis must embody a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XXI. ROMAN LITERATURE AND HISTORY

Albert Granger Harkness, A.M., Litt.D., *Professor of Roman Literature and History*

John Francis Greene, A.M., *Assistant Professor of Roman Literature and History*

1. *Livy*

Designed to enable the student to acquire facility in reading Latin, and to instruct him in the use of the Latin texts as a means of gaining a knowledge of Roman history; grammatical study and literary criticism also receive attention. *Professors* Harkness *and* Greene.

Three hours. First term. Elective for students who presented elementary and advanced Latin for admission. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Sat., at 12.20.*

2. *Cicero's Letters*

Aims and methods as in 1. *Professors* Harkness *and* Greene.

Three hours. Second term. Elective for students who presented elementary and advanced Latin for admission. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Sat., at 12.20.*

3. *Tacitus' Germania and Agricola*

Aims and methods as in 1. *Professors* HARKNESS *and* GREENE.

Three hours. Third term. Elective for students who presented elementary and advanced Latin for admission. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Sat., at 12.20.*

4. *Horace's Odes and Epodes*

Critical study of the poems, supplemented by rapid reading with a view to comprehending the spirit of the author; the literary side of the study is made prominent. Lectures; literary topics assigned to the class for special study. *Professor* GREENE.

Three hours. First term. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

5. *Catullus, Tibullus, and Propertius*

Aims and methods as in 4. *Professor* GREENE.

Three hours. Second term. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

6. *Horace's Satires*

Aims and methods as in 4. *Professor* HARKNESS.

Three hours. Third term. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

[7, 8, 9. *Latin Poetry*]

Aims to give a connected and comprehensive view of the history and development of Latin poetry. Forms with 10, 11, 12 a two-year consecutive course affording a general survey of Roman literature. Lectures on the lives and writings of the authors; reading of characteristic selections; special study by members of the class of assigned topics in literary history and criticism. First term, Plautus. Second term, Lucretius. Third term, Juvenal and Martial. *Professors* HARKNESS *and* GREENE.

Three hours. Through the year. Elective for Juniors and Seniors. Each term may be elected independently. Not offered in 1910–11.

10, 11, 12. *Latin Prose*

Aims to give a connected and comprehensive view of the history and development of Latin prose. Forms with 7, 8, 9 a two-year consecutive course affording a general survey of Roman literature. Lectures on the lives and writings of the authors, on the development of oratory, etc.; reading of characteristic selections; special study by members of the class of assigned topics in literary history and criticism. First term, specimens of early Latin, Cicero's *Brutus,* and Quintilian. Second term, Cicero. Third term, the *Annals* of Tacitus. *Professors* HARKNESS *and* GREENE.

Three hours. Through the year. Elective for Juniors and Seniors. Each term may be elected independently. *Tu., Fri., Sat., at 10.20.*

13, 14, 15. *Petronius, Pliny the Younger, Martial*

Professor HARKNESS.

One hour. Through the year. Elective for Juniors, Seniors, and Graduates. *Fri. at 2.20.*

[16, 17, 18. *Epigraphy*]

Professor HARKNESS.

Two hours. Through the year. Elective for Graduates and approved Undergraduates. Not offered in 1910–11.

22, 23, 24. *Latin Composition*

Professor GREENE.

One hour. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon. at 3.20.*

25, 26, 27. *Seminary in Latin*

Subject for 1910–11: Reading from the poetry of the Empire. Gudeman's *Latin Literature of the Empire,* vol. II. Questions in textual criticism and in the structure of Latin verse will be considered. *Professors* HARKNESS *and* GREENE.

Two hours. Through the year. Elective for Graduates.

28, 29. *Roman Life*

The private and public life of the Romans. Intended to give a comprehensive view of the civilization of Rome. Study based on the monuments and literature. Lectures, supplemented by reading and reports. No knowledge of Latin required. A continuation of Greek 33, the three terms together constituting the course called the History of Greek and Roman Life and Institutions. *Professor* GREENE.

Three hours. Second and third terms. Elective for Freshmen and Sophomores. *Mon., Tu., Th., at 11.20.*

[30. *Roman Literature*]

A brief history of Roman literature. Some of the most important and characteristic works studied in English translations. No knowledge of Latin required. Follows Greek 34 and is continued in the third term by Indo-European Philology 1. *Professor* HARKNESS.

Three hours. Second term. Elective for Freshmen and Sophomores. Not offered in 1910–11.

[31, 32, 33. *History of the Roman Empire*]

First term, the Early Empire. Second term, the Age of the Antonines. Third term, the Age of Constantine. *Professor* GREENE.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Each term may be elected independently. Not offered in 1910–11.

XXII. ROMANCE LANGUAGES AND LITERATURES

COURTNEY LANGDON, A.B., *Professor of the Romance Languages and Literatures*

ALBERT BUSHNELL JOHNSON, A.M., *Associate Professor of the Romance Languages*

CHARLES HERMAN HUNKINS, A.B., *Instructor in French*

GILBERT CHINARD, B. ès L., L. ès L., *Instructor in French*

1 a. *Elementary Course. First year*

Grammar, composition, dictation, conversation; translation of selections from modern authors into idiomatic English. *Messrs.* HUNKINS *and* CHINARD.

Three hours. Through the year. Required of all students who did not present French for admission. *1st div. Tu., Th., Sat., at 8; 2d div. Tu., Wed., Sat., at 9.20; 3d div. Mon., Tu., Th., at 2.20.*

1 b. *Elementary Course. Second year*

Reading of easy modern French prose in the form of stories, plays, or historical or biographical sketches. Review of grammar, composition and conversation based upon the texts read. *Mr.* CHINARD.

Three hours. Through the year. Elective for students who have credit for 1 a. *Mon., Th., Fri., at 9.20.*

2, 3, 4. *Intermediate Course*

Reading of modern and classical authors. Review of grammar; composition and conversation based upon the texts read; dictation. *Messrs.* Hunkins *and* Chinard.

Three hours. Through the year. Required of all students who presented elementary French for admission. Elective for students who have credit for 1. *1st div. Wed., Fri., Sat., at 11.20; 2d div. Tu., Th., Fri., at 8; 3d div. Mon., Th., Fri., at 9.20.*

5, 6, 7. *French Language and Literature*

An introduction to classical and modern French literature; composition; conversation based on the texts read; dictation. *Professor* Johnson *and Mr.* Hunkins.

Three hours. Through the year. Elective for students who presented advanced French for admission or who have credit for 2, 3, 4. *Mon., Tu., Th., at 11.20.*

[8, 9, 10. *French Literature from 1800 to 1850*]

Chateaubriand, Hugo, Lamartine, De Musset, De Vigny, Balzac, George Sand, and Gautier; abstracts, in French, of works read outside the class; sight reading a prominent feature. *Professor* Johnson.

Three hours. Through the year. Elective for students who have credit for 5, 6, 7. Not offered in 1910–11.

11, 12, 13. *French Literature since 1850*

Flaubert, Augier, the younger Dumas, the Goncourts, Daudet, Zola, Taine, Loti, and others; abstracts, in French, of works read outside the class; sight reading a prominent feature. *Professor* Johnson.

Three hours. Through the year. Elective for students who have credit for 5, 6, 7 or 8, 9, 10. *Mon., Th., Fri., at 9.20.*

[17, 18, 19. *Old French*]

The elements of Romance philology and an introduction to the literature of the Middle Ages in France.

Three hours. One session weekly. Through the year. Elective for approved Seniors and Graduates. Not offered in 1910–11.

20, 21, 22. *French Literature from 1600 to 1800*

The history of the classical school; its formation, its apogee and its decline. Particular attention will be given to those writers who did not employ the dramatic form. Lectures in French. *Mr.* Chinard.

Three hours. Through the year. Elective for students who have credit for 10 or 13 and for approved students who have credit for 5, 6, 7. *Mon., Tu., Th., at 11.20.*

23, 24, 25. *The French Drama*

The history of the French drama. The classical school from Corneille to Beaumarchais and the romantic and realistic schools from Hugo to Rostand. Lectures in French. *Professor* LANGDON.

Three hours. Through the year. Elective for students who have credit for 7, 10, or 13. *Tu., Fri., Sat., at 10.20.*

[50. *Molière in English*]

A study of Molière's plays, by means of English translation, in the light of the French civilization of the seventeenth century. *Professor* LANGDON.

Three hours. First term. Elective for Sophomores and Juniors who also elect German 50 and English 50. Not offered in 1910–11.

26, 27, 28. *Modern Italian*

Grammar, composition, conversation, and rapid translation of modern authors. *Professor* LANGDON.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern foreign language. *Mon., Th., Fri., at 9.20.*

[29, 30, 31. *Italian Literature from 1321 to 1800*]

Selections from Petrarch, Sacchetti, Tasso, Macchiavelli, and Goldoni, with a brief survey of the life and history of the times. *Professor* LANGDON.

Three hours. Through the year. Elective for students who have credit for 26, 27, 28. Not offered in 1910–11.

[32, 33, 34. *Classical Italian*]

Selections from Dante, Petrarch, Ariosto, and Tasso. *Professor* LANGDON.

Three hours. Through the year. Elective for students who have credit for 26, 27, 28. Not offered in 1910–11.

35, 36, 37. *Dante in English*

A study of the whole of the *Divina Commedia* in English, in the light of modern thought and in connection with other great world-poems. An introduction to a study of comparative literature by means of the best available translations. *Professor* LANGDON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

38, 39, 40. *Modern Spanish*

Grammar, conversation, composition, writing from dictation, and rapid reading. *Professor* Johnson.

Three hours. Through the year. Elective for Juniors, and for Sophomores not electing more than one other modern foreign language. *Tu., Fri., Sat., at 10.20.*

41, 42, 43. *Spanish Language and Literature*

Selected works of classical and modern authors; composition; conversation. *Professor* Johnson.

Three hours. Through the year. Elective for students who have credit for 38, 39, 40. *Wed., Fri., Sat., at 11.20.*

XXIII. SOCIAL AND POLITICAL SCIENCE‡

George Grafton Wilson, Ph.D., *Professor of Social and Political Science*

James Quayle Dealey,† Ph.D., *Professor of Social and Political Science*

Lester Frank Ward, A.M., LL.D., *Professor of Sociology*

Walter Fairleigh Dodd, Ph.D., *Lecturer in Social and Political Science*

Carol Aronovici, S.A.B., Litt.B., *Assistant in Social Science*

POLITICAL SCIENCE

1. *Political Science, Elementary*

Affords a general outline of the subject, and serves as an introduction to the more extended and special courses which follow. *Professor* Wilson [this year *Dr.* Dodd].

Three hours. Second term. Sophomore, Junior, or Senior year. Required of candidates for the degree of Bachelor of Arts ; elective for others. Preceded by Economics 1. *1st div. Tu., Fri., Sat., at 10.20 ; 2d div. Mon., Wed., Fri., at 12.20.*

2. *International Relations*

International law, diplomacy, and world-politics. *Professor* Wilson.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

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‡ The courses in this department other than 1 are open only to those students who have credit for Economics 1, Political Science 1, and Social Science 1, which together constitute an introduction to the advanced work of the departments of Social and Political Science and Economics.

† On leave of absence during the academic year 1910–11.

3, 4. *American Government*‡

First term, constitution, organization, powers, and methods of the national system of government. Second term, organization and functions of the states and cities of the United States. Followed by 5 in the third term. *Professor* Dealey [this year *Dr.* Dodd].

Three hours. First and second terms. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

5. *Comparative Study of Constitutions*‡

The constitutions of Germany, France, Great Britain, and Switzerland especially considered. *Professor* Dealey [this year *Dr.* Dodd].

Three hours. Third term. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

14. *Development of Political Theory*§

The growth of important political ideas traced from Plato to the present time, with emphasis on the evolution of democracy. *Professor* Dealey [this year *Dr.* Dodd].

Three hours. First term. Followed in the second term by 13. Elective for Juniors, Seniors, and Graduates. *Tu., Wed., Sat., at 9.20.*

13. *The State*§

The origin, forms, development, functions, and institutions of the state. *Professor* Dealey [this year *Dr.* Dodd].

Three hours. Second term. Followed in the third term by 8. Elective for Juniors, Seniors, and Graduates. *Tu., Wed., Sat., at 9.20.*

8. *Constitutional Law*§

The principles and development of constitutional law, with special reference to the Constitution of the United States. *Professor* Dealey [this year *Dr.* Dodd].

Three hours. Third term. Preceded in the second term by 13. Elective for Juniors, Seniors, and Graduates. *Tu., Wed., Sat., at 9.20.*

7. *Jurisprudence*||

The fundamental principles of law and legal relations. *Professor* Wilson.

Three hours. One term. Offered if applied for by Graduates.

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‡ Courses 3, 4, 5, form a single course continuous through the year.

§ Courses 14, 13, 8, form a single course continuous through the year.

|| Courses 6, 7, 9–12, 15, are primarily for Graduates, and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

6. *Roman Law*‡

The influence of Roman law on ancient and modern political institutions. *Professor* Wilson.

Three hours. One term. Offered if applied for by Graduates.

9. *The Latin-American Republics*‡

The government and social conditions of the Latin-American Republics. *Professor* Wilson.

Three hours. One term. Offered if applied for by Graduates.

10. *Political Parties*‡

The development of political parties in the United States and Europe. *Professor* Wilson.

Three hours. One term. Offered if applied for by Graduates.

11. *Administration*‡

The principles and the chief national systems of administration. *Professor* Wilson.

Three hours. One term. Offered if applied for by Graduates.

12. *Administration (continued)*‡

Local and colonial administration. *Professor* Wilson.

Three hours. One term. Offered if applied for by Graduates.

15. *Current Political Theory and Practice*‡

A seminary course. Intended to train students in methods of estimating the value and significance of recent publications on political topics and the changes consequent upon current political development. *Professors* Wilson *and* Dealey [this year *Dr.* Dodd].

One hour. Through the year. Elective for Graduates. *Mon. at 5.*

20, 21, 22. *Investigation of Special Topics*

Intended to train the student in methods of gathering, handling, and presenting data in the study of political problems. In connection with this course, work in comparative legislation may be taken under the direction of the Legislative Reference Bureau of the State Library. Laboratory methods. *Professors* Wilson *and* Kirk.

Three hours. Six hours of attendance. Through the year. Elective for Graduates and for approved Juniors and Seniors.

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‡ Courses 6, 7, 9–12, 15, are primarily for Graduates, and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

SOCIAL SCIENCE

1. *Social Science, Elementary*

Affords a general outline of the subject, and serves as an introduction to the more extended and special courses which follow. *Professor* Dealey [this year *Professor* Wilson].

Three hours. Third term. Sophomore, Junior, or Senior year. Must be preceded by Economics 1 and Political Science 1. Required of candidates for the degree of Bachelor of Arts; elective for others. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Mon., Wed., Fri., at 12.20.*

2. *Social Institutions, Conditions, and Problems*

Historical development of domestic, religious, and political institutions; study of such social problems as charity, crime, intemperance, marriage and divorce, etc. First and second terms, *Professor* Wilson. Third term, [this year] *Dr.* Dodd.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

3. *Origin and Development of Society* ‡

The formation of human institutions and their subsequent modifications. *Professor* Ward.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

4. *Social Philosophy* ‡

The relation of sociology to other sciences, especially its psychic aspects, and the interpretation of social phenomena. *Professor* Ward.

Three hours. First and second terms. Followed in third term by Social Science 5. Elective for Seniors and Graduates *Wed., Fri., Sat., at 11.20.*

5. *Application of Sociological Principles* ‡

The utility of sociology as the basis of legislation and of the social art. The improvement of society through conscious effort. *Professor* Ward.

Three hours. Third term. Elective for Seniors and Graduates. *Wed., Fri., Sat., at 11.20.*

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‡ Course 3 deals with the subject chiefly from the historical standpoint. Course 4 deals mainly with the principles and theory of sociology. Undergraduates should not elect both of these courses in the same year, and 3 should precede 4. Course 5 may properly follow either of these.

10. *Sociological Theories of the Nineteenth Century and their Significance* ‡

A review of modern sociological thought in Europe and America, and its influence on the life and institutions of society. *Professor* WARD.

Three hours. Through the year at 4.30. Days to be arranged with the class. Elective for Graduates. Alternates with 6.

7. *Current Social Theory and Practice* ‡

A seminary course. (*See* Political Science 15.) *Professors* WILSON *and* DEALEY [this year *Professor* WILSON].

One hour. Through the year. Elective for Graduates. *Mon. at 4.*

8. *Demography* ‡

Dispersion of races; social study of race characteristics; emigration, immigration, etc. *Professor* WILSON.

Three hours. One term. Offered if applied for by Graduates.

9. *Development of Social Theory* ‡

Traces important theories, ancient and modern, in regard to social conditions and development. *Dr.* DODD.

Three hours. One term. Offered if applied for by Graduates.

[6. *Sociological Aspects of Education*] ‡

The social importance of intellectual development and of the diffusion of knowledge. *Professor* WARD.

Three hours. Through the year. Elective for Graduates. Alternates with 10. Not offered in 1910–11.

20, 21, 22. *Investigation of Special Topics*

Intended to train the student in methods of gathering, handling, and presenting data in the study of social problems. During the year 1910–11 a special investigation course on Municipal Conditions and Social Welfare, including a study of social statistics, will be given by Carol Aronovici, Head of the Union Settlement. Laboratory methods. Under the direction of *Professors* WILSON *and* KIRK.

Three hours. Six hours of attendance. Through the year. Elective for Graduates and for not more than twelve Juniors and Seniors approved by the department.

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‡ Courses 6–10 are primarily for Graduates, and may be elected by those Undergraduates only who are approved by the department. These courses are given according to the needs of qualified applicants.

MUSIC

Hamilton Crawford MacDougall, Mus.D., *Lecturer in Music*

1, 2, 3. *The Evolution of Modern Music*

A general course in the history of modern music from Beethoven to Wagner, Richard Strauss and Debussy. Lectures, illustrations on the pianoforte, required readings, not more than ten short papers (800 to 1200 words), and special work in discriminative listening. Designed to give power of appreciation and interpretation with the minimum of technical detail. *Professor* MacDougall.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. No previous knowledge of music required. *Mon., Th., at 10.20*, and a third hour at the pleasure of the instructor.

PHYSICAL TRAINING

Frederick William Marvel, Ph.B., *Professor of Physical Training*

From the close of the Thanksgiving recess to the end of the second term, all first and second year students are required to attend gymnasium exercises three times a week as follows:

Freshmen. *1st div. Tu., Fri., Sat., at 10.20; 2d div. Mon., Tu., Th., at 4.20.*

Sophomores. *1st div. Mon., Wed., Th., at 10.20; 2d div. Tu., Th., Fri., at 3.20.*

A voluntary class for Juniors and Seniors will be held on *Mon., Tu., Th., Fri., at 5.10.* Classes in heavy gymnastics, under the direction of a special instructor, are held four afternoons a week. Classes in wrestling, under the direction of a special instructor, are held three afternoons a week. Instruction in swimming, under the direction of a special instructor, is given by appointment.

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VIII JUNE, 1911 NO. 3

BULLETIN
OF
BROWN UNIVERSITY

ANNOUNCEMENT OF COURSES
1911-1912

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WOMEN'S COLLEGE EDITION

PROVIDENCE
PUBLISHED BY THE UNIVERSITY
[APRIL, MAY, JUNE, OCTOBER, DECEMBER]

as second-class matter April 1, 1905, at the Post Office at Providence, R. I., under Act of Congress of July 16, 1894

ANNOUNCEMENT OF COURSES
OFFERED AT
THE WOMEN'S COLLEGE
IN
BROWN UNIVERSITY
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PROVIDENCE, RHODE ISLAND
PUBLISHED BY THE UNIVERSITY
1911

GENERAL ANNOUNCEMENTS

FOR

THE ACADEMIC YEAR

1911–12

⁂

THE Academic Year begins with chapel service in Pembroke Hall, at 9 a.m., on Wednesday, September 27.

For information regarding Entrance Examinations, Registration and Enrolment of Undergraduates and Graduates, and Requirements for the various Degrees, see pages 6–20 of this Announcement. The following special announcements relate to the Women's College. Undergraduates must register at the Registrar's Office, in Pembroke Hall, between 9 a.m. and 12 m., or between 2 p.m. and 4 p.m., on September 25 and 26. Undergraduates in residence must return their Registration cards to the Register not later than June 4. Graduate students register at the office of the Registrar of the University.

COURSES OF INSTRUCTION

WITH the exception of Biology 1 and 50, Greek Literature and History 20, and Roman Literature and History 3, courses of instruction are identical with corresponding courses offered to men. Detailed information may be found on pages 21–88. The officers of instruction are those conducting courses for men also, with the addition of:

LIDA SHAW KING, A.M., *Professor of Classical Literature and Archaeology*

ALICE WILSON WILCOX, A.M., *Instructor in Biology*

*Courses designated by a † are given at the University; women are admitted to them, but only on the recommendation of the Dean of the Women's College. Women may also be admitted to other University courses not announced here, with the special permission of the department and with the consent of the Dean of the Women's College. In courses designated by a * a final mark covering the work of the course as a whole is given at the end of the course, the marks given at the end of the first semester being regarded* *as temporary. Graduate courses are not included in this list, although approved Seniors are admitted to many of them. For Graduate courses, see pages 21–88.*

ART

[1, 2. *History of Art from Antiquity through the Renaissance*]

Not offered in 1911–12.

3, 4. *Modern Art, and Theory and Criticism of the Fine Arts*

Professor POLAND.

Three hours. Through the year. Course 3 is elective for students who have completed 2. Course 4 is elective for students who have completed 1, or 2, or 3. *Tu., Wed., Sat., at 9.25.*

15, 16. *Freehand Drawing*

One hour. Two hours of drawing. Through the year. Elective for all students. Given at the Rhode Island School of Design, mornings or afternoons, as arranged with the Director.

17, 18. *Advanced Drawing and Color Work*

Three hours. Six hours of drawing, or four hours of drawing and one hour lecture on Historic Ornament. Through the year. Elective for students who have credit for 15, 16, and who have taken or are taking 1, 2. Given at the Rhode Island School of Design. *Mon., Tu., Wed., at 2.* Lecture hour as arranged by the Rhode Island School of Design.

19, 20. *Architectural Design*

Three hours. One hour of recitation and four hours of drawing. Through the year. Elective for students who have credit for Mechanical Drawing 3, 4. Given at the Rhode Island School of Design by Mr. HUGER ELLIOTT, Director. *Mon. at 3.* Drawing hours to be arranged with the Director.

ASTRONOMY

1, 2. *General Course*

Professor UPTON.

Three hours. First semester. Elective for Juniors and Seniors who have credit for Mathematics 1, 2. *Wed., Fri., Sat., at 11.25.* Observations at Ladd Observatory.

7, 8.† *Advanced Astronomy*

Three hours. Through the year. Elective for approved students who have credit for 2 or 4. Not given unless elected by four or more students.

BIBLICAL LITERATURE AND HISTORY

1, 2.† *Elementary Hebrew*

Dr. STERN.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

11, 12.† *Gospels and Epistles*

Professor FOWLER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each semester may be elected independently. *Wed., Fri., Sat., at 11.20.*

[13, 14.† *Acts and Pauline Epistles*]

Not offered in 1911–12.

[15, 16. *Old Testament Literature and History*]

Not offered in 1911–12.

17, 18. *New Testament Literature and History*

Professor FOWLER.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Each semester may be elected independently. *Tu., Wed., Sat., at 9.25.*

[19, 20. *The English Bible as Literature*]

Not offered in 1911–12.

21, 22.*† *Biblical Seminary*

Professor FOWLER.

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors.

BIOLOGY

1, 2. *General Biology*

The structure of animals and plants; elementary vital phenomena; the functions of organs; the development of organisms; classification. An outline of the more important biological theories, such as evolution, natural selection, variation, mutation, and heredity, and the principles upon which modern hygiene and sanitation are based. The course will introduce the student to the use of the microscope, laboratory technic, and to scientific methods of observation and experiment. *Miss* WILCOX, *assisted by Miss* MALLETT.

Three hours. Six hours of attendance. Through the year. Required in Freshman or Sophomore year of candidates for the degree of Bachelor of Philosophy beginning with the class entering in 1911. Elective for Undergraduates. *Tu., Wed., Sat., 9.25 to 11.15.*

3, 4.† *Comparative Anatomy of Vertebrates*

Professor Walter.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1, 2. *Mon., Wed., Fri., at 8.*

5, 6.† *Anatomy of the Nervous System*

Professor Mead.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2.

7, 8.† *Embryology and Histology*

Professor Mead.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2. *Tu., Th., Sat., at 8.*

9, 10.† *Advanced Histology and Pathology*

Professor Mead.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates, who have credit for 1, 2, and 7, 8.

11, 12.† *General Physiology*

Dr. Mitchell.

Three hours. Six hours of attendance. Through the year. Must be preceded by 1, 2, and by Chemistry 1, 2. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department.

13, 14.† *Chemical Physiology*

Dr. Mitchell.

Three hours. Six hours of attendance. Through the year. Must be preceded by Chemistry 1, 2, and 10. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Tues., Fri., Sat., at 10.20.*

16.† *Bacteriology*

Professor Gorham.

Three hours. Six hours of attendance. Second semester. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon., Wed., Th., at 10.20.*

17, 18.† *Advanced Bacteriology*

Professor Gorham.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 16.

19.† *Invertebrate Zoölogy*

Professors Gorham *and* Walter.

One hour. Two hours of attendance. First semester. *Wed. at 2.20.*

20. *Ornithology*

Professor Walter.

One hour. Two hours of attendance. Second semester. Elective for Undergraduates.

[24.† *Physiology*]

Not offered in 1911–12.

50. *Euthenics*

An experimental study of food and nutrition as the basis of the health of the individual. It includes the chemistry of the main food constituents; proteids, carbohydrates, fats; physiology of digestion and assimilation; quantitative analysis of milk, etc.; principles of selection and preparation of food; study of dietaries. *Miss* Wilcox *assisted by Miss* Mallett.

Three hours. First semester. Six hours of attendance. Elective for all Undergraduates who have had elementary chemistry. *Mon., Wed., Th., 10.25 to 12.15.*

51.

A theoretical study of the home as the centre of sanitary, aesthetic, and efficient family life. It includes the principles of selection of the ideal building site; sanitary construction of the house, with reference to the chief domestic supplies; air, water, light, heat, etc.; principles of household management from the point of view of the economic division of income, time and labor of the home-maker, and the health and efficiency of the household. In place of laboratory work the second semester, plans, special topics and demonstrations of important features of domestic and municipal sanitation. *Miss* Wilcox *assisted by Miss* Mallett.

Three hours. Second semester. Elective for those who have had 50, and for others upon consultation. *Mon., Wed., Th., 10.25 to 12.15.*

BOTANY

1, 2. *General Course*

Professor Collins.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. *Tu., Wed., Sat., at 9.25.*

3, 4.† *Histology and Physiology*

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1, 2, and for approved Graduates. Not to be offered in 1912–13. Alternates with 5, 6.

[5, 6.† *Comparative Morphology*]

Not offered in 1911–12.

7, 8.† *Advanced Course*

One or more hours. Through the year. Each semester may be elected independently. Elective for Graduates, and for approved Juniors and Seniors.

10.† *Trees*

One hour. Two hours of attendance. Second semester. Elective for Undergraduates. *Wed. at 8.*

CHEMISTRY

1, 2. *Descriptive Chemistry*

Professor Bucher *and Mr.* Holt.

Three hours. Through the year. Elective for Undergraduates. *Tu., Th., Sat., at 12.25.* Laboratory hours to be arranged with the instructor.

3, 4.† *Qualitative and Quantitative Analysis*

Professor Appleton *and Mr.* Crossley.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2. *1st div., Fri. at 11.20; 2d div., Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

5, 6.† *Quantitative Analysis, Advanced Course*

Professor Appleton *and Mr.* Crossley.

Six hours. Twelve hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3, 4. Laboratory hours to be arranged with the instructor.

7, 8.† *Organic Chemistry*

Professor Bucher *and Mr.* Holt.

Six hours. Through the year. Lectures and laboratory work. Elective for approved Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

10.† *Assaying*

Professor Appleton *and Mr.* Crossley.

Six hours. Twelve hours of attendance. Second semester. Elective for Seniors and Graduates who have credit for 1–4.

12.† *Organic Dyes*

Professor Appleton *and Mr.* Crossley.

Six hours. Twelve hours of attendance. Second semester. Elective for approved Seniors and Graduates.

15, 16.† *Physical Chemistry*

Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

20.† *Inorganic Chemistry, Advanced Course*

Professor Bucher.

Three hours. Second semester. Elective for approved Juniors, Seniors, and Graduates.

21, 22.† *Organic Preparations, Advanced Course*

Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

23, 24.† *Inorganic Preparations, Advanced Course*

Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates who have credit for 7, 8.

27, 28.† *Conference on Special Topics in Chemistry*

Professor Bucher.

One hour. Through the year. Elective for approved students.

29, 30.† *Conference on Special Topics in Chemistry*

Professor Appleton.

One hour. Through the year. Elective for approved students.

ECONOMICS

1. *Elementary Economics*

Professor Motley.

Three hours. In connection with Social and Political Science 1 constitutes a year course required in Sophomore, Junior, or Senior year of candidates for the degree of Bachelor of Arts. Elective for others. Beginning with the class entering in 1911, required also of candidates for the degree of Bachelor of Philosophy. First semester, *Tu., Th., Sat., at 12.25.*

3, 4.† *General Economics*

Professor Motley *and Mr.* Whitnack.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.20.*

5, 6.† *Money and Banking*

Mr. Whitnack.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

7. *Socialism and Labor Problems*

Professor Motley.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.25.*

10.† *Tariff, Reciprocity, and Shipping Subsidies*

Professor Motley.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

[11.† *Public Finance*]

Not offered in 1911–12.

[12.† *The Financial History of the United States*]

Not offered in 1911–12.

[13.† *Statistics*]

Not offered in 1911–12.

[14. † *Accounting*]

Not offered in 1911–12.

[15. † *Trade and Transportation*]

Not offered in 1911–12.

[16. † *Corporations and Corporation Finance*]

Not offered in 1911–12.

21, 22. † *Investigation of Special Topics*

Professor MOTLEY *and Mr.* WHITNACK.

Three hours. Six hours of attendance. Through the year. Each semester may be elected independently. Students intending to take either of these courses must secure the permission of the head of the department not later than December 1 or June 1 in the semester preceding that in which they desire to take the course. It is expected that as a rule these courses will be taken in connection with lecture courses. Hours to be arranged.

23, 24. † *Economic Seminary*

Professor MOTLEY *and Mr.* WHITNACK.

Three hours. Two hours of attendance. Through the year. Elective for Seniors and Graduates who have taken advanced work in Economics. Hours to be arranged.

EDUCATION

1. *History of Education*

Professor JACOBS.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates, and by permission. *Mon., Wed., Th., at 10.25.*

2. *Principles of Education*

Professor JACOBS.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates, and by permission. *Mon., Wed., Th., at 10.25.*

3. *The Process of Education; its Psychology and Hygiene*

Professor JACOBS.

Three hours. First semester. Elective for students who have credit for 1 or 2, or who are taking 1, and for Graduates. *Mon., Th., Fri., at 9.25.*

4. *Practical Introduction to Teaching*

Professor JACOBS.

Three hours. Second semester. Elective for students who have taken or are taking other courses in Education, and for Graduates. *Mon., Th., Fri., at 9.25.*

ENGLISH

1, 2. *Rhetoric and Composition*

Messrs. HASTINGS, HARKNESS, *and* GROSE.

Three hours. Through the year. Required of all Freshmen. *1st div., Mon., Th., Fri., at 9.25; 2d div., Tu., Wed., Sat., at 9.25.*

5, 6. *English Composition, Advanced Course*

Professor BENEDICT.

Three hours. Through the year. Elective for Juniors and Seniors, and, with the permission of the instructor, for Sophomores who have attained the grade of C in 1, 2. With the consent of the instructor the course may be repeated. *Mon., Th., Fri., at 9.25.*

[7, 8. *Argumentative Composition*]

Not offered in 1911–12.

10. *Debate*

Professor HUNTINGTON.

Three hours. First semester. Elective for a limited number of Juniors and Seniors. With the consent of the instructor the course may be repeated. *Mon., Tu., Th., 2.25 to 4.15.*

[11, 12. *Public Speaking*]

Not offered in 1911–12.

15, 16.† *Old English*

Professor POTTER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 4.20.*

17, 18.† *Chaucer*

Professor POTTER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 3.20.*

19, 20. *English Literature from the Beginning to 1892*

Professor Huntington.

Three hours. Through the year. Elective for Sophomores, and for Freshmen who are candidates for the degree of Bachelor of Philosophy. *Wed., Fri., Sat., at 11.25.*

[21, 22. *History of the Drama in England*]

Not offered in 1911–12.

23. *The Modern English Drama*

Professor Crosby.

Three hours. First semester. Elective for Juniors and Seniors who have credit for a year's work in English Literature. *Tu., Fri., Sat., at 10.25.*

42. *Contemporary English and American Literature*

Professor Crosby.

Three hours. Second semester. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.25.*

[25, 26. *Shakspere*]

Not offered in 1911–12.

27, 28. *Shakspere*

Professor Potter.

Three hours. Through the year. Elective for Juniors and Seniors. *Tu., Th., Sat., at 12.25.*

[29, 30. † *English Literature exclusive of the Drama, from 1600 to 1660*]

Not offered in 1911–12.

[31, 32. *English Literature from 1660 to 1798*]

Not offered in 1911–12.

[35. *English Literature from 1798 to 1832, Poetry*]

Not offered in 1911–12.

[36. *English Literature from 1798 to 1832, Prose*]

Not offered in 1911–12.

37. *English Literature from 1832 to 1892, Prose*

Professor Benedict.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. First semester. Elective for Sophomores, Juniors, and Seniors. *Mon. Tu., Th., at 11.25.*

38. *English Literature from 1832 to 1892, Poetry*

Professor Benedict.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Second semester. Elective for Sophomores, Juniors, and Seniors. *Mon., Tu., Th., at 11.25.*

39, 40. *American Literature*

Professor Bronson.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for a year's work in English Literature. *Mon., Wed., Fri., at 12.25.*

43, 44.† *Seminary in English Literature*

Professor Bronson.

Three hours. Two hours of attendance. Through the year. Elective for Graduates, and for a limited number of Seniors who have attained the grade of C in two years' work in English Literature.

GEOLOGY

5.† *Physical Geography*

Professor Brown.

Three hours. First semester. Elective for Undergraduates excepting Freshmen and Sophomores who are not taking another course in the department. *Mon., Th., at 10.20.* Conference hour to be arranged with the instructor.

6.† *Economic Geography and Conservation*

Professor Brown.

Three hours. Second semester. Elective for Undergraduates who have credit for 1 or 5, or who presented physiography for admission, excepting Freshmen and Sophomores who are taking another course in the department. *Tu., Wed., Sat., at 9.20.*

GERMANIC LANGUAGES AND LITERATURES

1, 2. *Elementary Course*

Mr. Sievers.

Three hours. Through the year. Required of all students who did not present German for admission. *Mon., Wed., Fri., at 12.25.*

3, 4. *Reading Course*

Professor Crowell.

Three hours. Through the year. Elective for students who have credit for 1, 2. *Mon., Tu., Th., at 11.25.*

5, 6. *Intermediate Course*

Mr. Keenan.

Three hours. Through the year. Required of all Freshmen who presented elementary German for admission. Not elective for students who have taken German in college. *Mon., Wed., Fri., at 12.25.*

7, 8. *Advanced Course in Standard Authors, Classical and Modern*

Mr. Bachmann.

Three hours. Through the year. Elective for students who have credit for 5, 6, or who presented advanced German for admission. *Mon., Wed., Fri., at 12.25.*

9, 10.† *Modern Prose*

Professor von Klenze *and Mr.* Sievers.

Three hours. Through the year. Elective for students who have credit for 3, 4; 5, 6; or 7, 8, or who presented advanced German for admission. *Tu., Fri., Sat., at 10.20.*

15, 16. *The German Short Story of the Nineteenth Century*

Professor von Klenze.

Three hours. Through the year. Elective for students who have credit for 3, 4; 7, 8; 9, 10. *Tu., Wed., Sat., at 9.25.*

21, 22.† *Goethe's Faust: Parts* 1 *and* 2

Professor Crowell.

Three hours. Through the year. Elective for students who have credit for 7, 8; 9, 10. *Mon., Th., Fri., at 9.20.*

25, 26.† *Outline History of German Literature*

Professor von Klenze.

Three hours. Through the year. Elective for students who have credit for 7, 8; 9, 10. *Tu., Th., Sat., at 12.20.*

33.† *Old Norse*

Professor Crowell.

Three hours. First semester. Elective for Graduates and approved Undergraduates. Students electing Old Norse should also take Germanic Mythology. *Mon., Tu., Th., at 3.20.*

34.† *Germanic Mythology*

Professor Crowell.

Three hours. Second semester. Elective for Graduates and approved Undergraduates. *Mon., Tu., Th., at 3.20.*

35, 36.† *Middle High German*

Professor von Klenze.

Three hours. Through the year. Elective for Graduates and approved Undergraduates. *Wed., Fri., Sat., at 11.20.*

GREEK LITERATURE AND HISTORY

A, B. *Elementary Course*

Mr. ——

Three hours. Through the year. Elective for students who did not present elementary and advanced Greek for admission. *Mon., Wed., Fri., at 12.25.*

1. *Homer and the Greek Anthology*

Professor Manatt.

Three hours. First semester. Elective for students who presented elementary and advanced Greek for admission, or who have credit for A, B, and have done the additional work indicated above. *Mon., Tu., Th., at 11.25.*

2. *Lysias and Plato*

Professor Allinson.

Three hours. Second semester. Elective for students who have credit for 1. *Mon., Tu., Th., at 11.25.*

3. *Lucian and the Dramatic Poets*

Professor Allinson.

Three hours. First semester. Elective for Sophomores. *Tu., Wed., Sat., at 9.25.*

4. *The Historians*

Professor Manatt.

Three hours. Second semester. Elective for Sophomores. *Tu., Wed., Sat., at 9.25.*

5. *Epic Poetry*

Professor MANATT.

Three hours. First semester. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.25.*

6. *The Drama*

Professor ALLINSON.

Three hours. Second semester. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.25.*

[7. *Lyric and Pastoral Poetry*]

Not offered in 1911–12.

[8. *Plato, Aristotle, and Aeschylus*]

Not offered in 1911–12.

[9. *The Attic Orators*]

Not offered in 1911–12.

[10. *Lucian and Pausanias*]

Not offered in 1911–12.

15. *Greek Civilization*

Professor ALLINSON.

Three hours. First semester. Required of all candidates for the degree of Bachelor of Philosophy. Elective for others. *Mon., Wed., Fri., at 12.25.*

16, 17, 19.† *Greek Seminary*

Professor ALLINSON.

Three hours. Two hours of attendance. Through the year. Elective for Graduates and approved Seniors.

20. *Introduction to Greek Archaeology*

Outline of the remains of the earliest Greek civilization; an introductory study of Greek vases, coins, small bronzes, and terra-cotta figurines. Intended to give a general survey of these sources for Greek history and life. Illustrated lectures; collateral reading. *Professor* KING.

Three hours. Second semester. Elective for students who have completed one course in Latin or Greek. *Mon., Th., Fri., at 9.25.*

HISTORY

1, 2. *Medieval and Modern History of Europe*

Professor MACDONALD.

Three hours. Through the year. Required of candidates for the degree of Bachelor of Arts in either the Sophomore or the Junior year, and for candidates for the degree of Bachelor of Philosophy in either the Freshman, Sophomore, or Junior year. *Mon., Tu., Th., at 11.25.*

[3. *Period of the Renaissance*]

Not offered in 1911–12.

[4. *Period of the Reformation*]

Not offered in 1911–12.

5. *The French Revolution and the Napoleonic Era*

Professor COLLIER.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.25.*

6. *Europe since 1815*

Professor COLLIER.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. Should preferably be preceded by 5. *Mon., Tu., Th., at 11.25.*

[7, 8. *English Constitutional and Political History to 1714*]

Not offered in 1911–12.

[9, 10. *English Constitutional and Political History since 1714*]

Not offered in 1911–12.

11, 12.† *Seminary in European History*

Professor COLLIER.

Three hours. One to two hours of attendance. Through the year. Elective for Graduates and approved Seniors.

13, 14. *American History*

Professor MACDONALD.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each semester may be elected independently, but 12 should preferably be preceded by 11. *Tu., Fri., Sat., at 10.25.*

15, 16.† *Constitutional and Political History of the United States*

Professor MacDonald.

Three hours. Two hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., at 12.20.*

17, 18.† *Seminary in American History*

Professor MacDonald.

Three hours. One to two hours of attendance. Through the year. Elective for Graduates and approved Seniors. The course should be preceded by 13, 14, or 15, 16, but in exceptional cases may be taken by students who at the same time are taking 13, 14, or 15, 16.

INDO-EUROPEAN PHILOLOGY

[2. *General Introduction to the Study of Language*]

Not offered in 1911-12.

MATHEMATICS

1 a. *Solid and Spherical Geometry*

Professor Richardson *and Dr.* Archibald.

Three hours. First semester. Required of candidates for the degree of Bachelor of Arts who presented only Algebra and Plane Geometry for admission. *Tu., Fri., Sat., at 10.25.*

2 a. *Trigonometry*

Professor Richardson *and Dr.* Archibald.

Three hours. Second semester. Required of candidates for the degree of Bachelor of Arts who presented only Algebra and Plane Geometry for admission.

3, 4. *Algebra*

Professor Manning.

Three hours. Through the year. Required of candidates for the degree of Bachelor of Arts who presented Solid Geometry and Plane Trigonometry for admission and do not take Mathematics 5, 6. Also required of candidates for the degree of Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission and do not take Mathematics 5, 6, and do not elect to take Argumentation in the Sophomore year. Elective for others. *Mon., Th., Fri., at 9.25.*

5. *Plane Analytic Geometry*

Professor Davis.

Three hours. First semester. Required of candidates for the degree of Bachelor of Arts who presented Solid Geometry and Plane Trigonometry for admission and do not take 3, 4. Also required of candidates for the degree of Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission and do not take 3, 4, and do not elect to take Argumentation in the Sophomore year. Elective for students who have credit for 1, 2. *Mon., Wed., Th., at 10.25.*

6. *Differential Calculus*

Professor Davis.

Three hours. Second semester. Required of candidates for the degree of Bachelor of Arts who presented Solid Geometry and Plane Trigonometry for admission and do not take 3, 4. Also required of candidates for the degree of Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission and do not take 3, 4, and do not elect to take Argumentation in the Sophomore year. Elective for students who have credit for 5. *Mon., Wed., Th., at 10.25.*

7, 8.† *Differential and Integral Calculus*

Mr. Currier.

Three hours. Through the year. Elective for students who have credit for 6. Students are recommended to take 14 before taking 8 or at the same time with it. *Tu., Th., Sat., at 12.20.*

9, 10.† *Differential Equations*

Professor Manning.

Three hours. Through the year. Elective for students who have credit for 6 or 20. *Tu., Th., Sat., at 12.20.*

21, 22.† *Function Theory of a Complex Variable*

Professor Manning.

Three hours. Through the year. Elective for Graduates and approved Seniors.

25, 26.† *Advanced Algebra*

Professor Richardson.

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors.

27, 28.† *Differential Geometry*

Dr. Archibald.

Three hours. Through the year. Elective for Graduates and approved Seniors.

[29, 30.† *Function Theory of a Real Variable*]
Not offered in 1911–12.

MUSIC

1. *The Symphony*

Professor MACDOUGALL.

Three hours. First semester. Elective for Sophomores, Juniors, and Seniors. No previous knowledge of music required. *Mon., Th., at 11.25.*

2. *Elementary Harmony*

Three hours. Second semester. Elective for Sophomores, Juniors, and Seniors. No previous knowledge of music required. *Mon., Th., at 11.25.*

PHILOSOPHY

3. *Psychology*

A survey of the main facts and laws of mental life, aiming to provide a sound foundation for further acquaintance with this and allied subjects, for an improved judgment in dealing with many practical problems, and for understanding the psychological bases of philosophy. *Professor* DELABARRE.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Th., Sat., at 12.25.*

5, 6.† *Psychology, Intermediate Course*

Professor DELABARRE.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for a course in Psychology.

7, 8. *History of Philosophy*

Professor EVERETT.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.25.*

[9. *Philosophy of Religion*]
Not offered in 1911–12.

11, 12.† *Experimental Psychology, Introductory Laboratory Course*

Professor DELABARRE.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3. Although essentially a year course, it may, by special arrangement with the instructor, be taken for a shorter period.

13, 14.† *Problems of Modern Philosophy*

A seminary course designed to give acquaintance with current philosophical problems and discussions. *Professor* Meiklejohn.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for a year course in Philosophy.

[15, 16.† *Kantian and Post-Kantian Philosophy*]

Not offered in 1911–12.

[17, 18.† *Psychology, Advanced Course*]

Not offered in 1911–12.

19, 20.† *Experimental Psychology, Advanced Laboratory Course*

Professor Delabarre.

One to six hours. Two to twelve hours of attendance. Through the year. Elective for students who have credit for 11, 12. May be taken for more than six hours by Graduates.

[20, 21.† *Advanced Ethics*]

Not offered in 1911–12.

23, 24.† *Philosophical Seminary*

Professor Everett.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for a year course in Philosophy.

PHYSICS

1, 2. *Elementary Physics*

Professor Barus.

Three hours. Through the year. Elective for Undergraduates who have credit for entrance algebra and plane geometry. *Mon., Tu., Th., at 11.25.*

3, 4.† *Elementary Physics, continued*

Professor Barus.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates who have credit for 1, 2. *Tu., Fri., Sat., at 10.20.*

5, 6.† *Experimental Physics*
Professor PALMER.

Three hours. Six hours in the laboratory. Through the year. Elective for students who have credit for 1, 2, or 3, 4.

7, 8.† *Mathematical Treatment of Dynamical Problems*
Professor PALMER.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 5, 6, and Mathematics 9.

9, 10.† *Mathematical Theory of Electricity and Magnetism*
Professor PALMER.

Three hours. Through the year. Elective for Graduates and Seniors who have credit for 5, 6, and Mathematics 9.

11, 12.† *Advanced Laboratory Course*
Professors BARUS, PALMER, *and* WATSON.

Three or six hours. Six or twelve hours of attendance. Through the year. Elective for students who have credit for 5, 6.

13, 14.† *Applied Harmonic Analysis and Applied Vector Analysis*
Professor BARUS.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 1, 2, and Mathematics 7, 8.

15, 16.† *Physics, Advanced Course*
Professor BARUS.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for Mathematics 7, 8.

23, 24.† *Precision Measurements in Photometry, Electricity, and Magnetism*
Professor PALMER.

Four hours. Eight hours in the laboratory. Through the year. Elective for students who have credit for 5, 6, or 21, 22, and Mathematics 7.

25, 26.† *Radiation, Optics, and Heat*
Professor PALMER.

Three or six hours. Six or twelve hours in the laboratory. Through the year. Elective for students who have credit for 5, 6, or 21, 22.

ROMAN LITERATURE AND HISTORY

1. *Livy*

Professor Greene.

Three hours. First semester. Elective for students who presented elementary and advanced Latin for admission. *Mon., Tu., Th., at 2.25.*

2. *Cicero's Letters*

Professor Greene.

Three hours. Second semester. Elective for students who presented elementary and advanced Latin for admission. *Mon., Tu., Th., at 2.25.*

3. *Catullus, Tibullus, Propertius*

Professor King.

Three hours. First semester. Elective for Sophomores. *Mon., Th., Fri., at 9.25.*

4. *Horace's Satires, Juvenal*

Professor Harkness.

Three hours. Second semester. Elective for Sophomores. *Tu., Fri., Sat., at 10.25.*

5, 6. *Latin Poetry*

Professors Harkness *and* Greene.

Three hours. Through the year. Elective for Juniors and Seniors. Each semester may be elected independently. *Tu., Th., Sat., at 12.25.*

[7, 8. *Latin Prose*]

Not offered in 1911–12.

[11, 12. *Latin Composition*]

Not offered in 1911–12.

15. *Roman Civilization*

Professor Greene.

Three hours. Second semester. Required in Freshman or Sophomore year of candidates for the degree of Bachelor of Philosophy. Elective for others. *Mon., Wed., Fri., at 12.25.*

ROMANCE LANGUAGES AND LITERATURES

1, 2. *Elementary Course. First Year*

Mr. CHINARD.

Three hours. Through the year. Required of students who did not present French for admission. *Mon., Wed., Th., at 10.25.*

5, 6. *Intermediate Course*

Dr. HUNKINS.

Three hours. Through the year. Required of students who presented elementary French for admission. Elective for students who have credit for 1, 2. *Mon., Wed., Th., at 10.25.*

7, 8. *Advanced Course*

Professor JOHNSON.

Three hours. Through the year. Elective for students who presented advanced French for admission, or who have credit for 5, 6. *Tu., Wed., Sat., at 9.25.*

9, 10. *The Realistic School*

Professor JOHNSON.

Three hours. Through the year. Elective for students who have credit for 7, 8. *Mon., Wed., Th., at 10.25.*

11, 12. *The Romantic School*

Professor LANGDON.

Three hours. Through the year. Elective for students who have credit for 7, 8. *Tu., Wed., Sat., at 9.25.*

13, 14.† *The Classical School*

Mr. CHINARD.

Three hours. Through the year. Elective for students who have credit for 9, 10, or 11, 12, and for approved students who have credit for 7, 8. *Mon., Tu., Th., at 11.20.*

15, 16.† *Modern Spanish*

Professor JOHNSON.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern language. *Tu., Fri., Sat., at 10.20.*

[17, 18. *Modern Italian*]

Not offered in 1911–12.

19, 20. *Dante in English*

Professor Langdon.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Students are advised to elect this course in their Senior year. *Wed., Fri., Sat., at 11.25.*

SOCIAL AND POLITICAL SCIENCE

SOCIAL SCIENCE

1. *Social and Political Science, Elementary*

Professor Dealey.

Three hours. In connection with Economics 1 constitutes a year course required in Sophomore, Junior, or Senior year of candidates for the degree of Bachelor of Arts, and in Sophomore year of candidates for the degree of Bachelor of Science. Elective for others. Beginning with the class entering in 1911, required also of candidates for the degree of Bachelor of Philosophy. Second semester, *Tu., Th., Sat., at 12.25.*

3, 4. *Social Problems and Conditions*

Professor Dealey *and Dr.* Dunning.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.25.*

5, 6.† *Ancient Society and its Institutions*

Professor Ward.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

7.† *Sociology as a Science*

Professor Ward.

Three hours. First semester. Elective for Seniors and Graduates. Followed by 8. *Wed., Fri., Sat., at 11.20.*

8.† *Application of Sociological Principles*

Professor Ward.

Three hours. Second semester. Elective for Seniors and Graduates. Preceded by either 5, 6, or 7. *Wed., Fri., Sat., at 11.20.*

9, 10.† *Sociological Aspects of Education*

Professor Ward.

Three hours. Through the year. Elective for Seniors and Graduates. *Tu., Fri., 4.30 to 6.*

13, 14.† *Investigation of Special Topics*

Professor Dealey.

Three hours. Six hours of attendance. Through the year. Elective for Graduates, and for a limited number of approved Juniors and Seniors. Each semester may be elected independently.

POLITICAL SCIENCE

3. *Government and Politics of the United States*

Dr. Dunning.

Three hours. First semester. To be followed in second semester by Economics 7. *Mon., Wed., Fri., at 12.25.*

11, 12.† *Current Social and Political Theory and Practice*

Dr. Dunning.

One hour. Through the year. Elective for Graduates and approved Seniors. *Mon. at 5.*

PHYSICAL TRAINING

Mrs. Paine

From December 4 to March 29, all first and second year students are required to attend gymnasium classes three times a week, as follows:

Sophomore Division: *Mon., Tu., Th., 2.30 to 3.15.*

Freshman Division: *Mon., Tu., Th., 3.25 to 4.10.*

A voluntary class for Juniors and Seniors will be held on *Fri. at 2.30.*

ANNOUNCEMENT OF COURSES
OFFERED IN
BROWN UNIVERSITY
1911–1912

PROVIDENCE, RHODE ISLAND
PUBLISHED BY THE UNIVERSITY
1911

CALENDAR 1911–1912

Vacations and holidays occurring within the academic year 1911–12 are indicated by dark type.

1911

S	M	T	W	T	F	S
			JULY			
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1912

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1912

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THE UNIVERSITY CALENDAR 1911–12

1911

September 6.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
September 21–26.	*Thursday, Friday, Saturday, Monday, and Tuesday.* Examinations for admission to the Freshman class and to advanced standing.
September 25, 26.	*Monday and Tuesday.* Registration of new students and enrolment of students previously in residence.
September 27.	*Wednesday.* Academic Year begins (fourth Wednesday in September). Last day for registration of Graduate students.
October 7.	*Saturday.* Examination in Greek for the President's Premiums, 5 Maxcy Hall, 2.30 p.m.
October 11.	*Wednesday.* Examination in Latin for the President's Premiums, 1 Sayles Hall, 2.30 p.m.
October 14.	*Saturday.* Examination in Mathematics for the Hartshorn Premiums, 27 Wilson Hall, 2 p.m.
October 18.	*Wednesday.* Examination in French for the Hicks Premiums, 1 Sayles Hall, 2.30 p.m.
October 21.	*Saturday.* Examination in German for the Hicks Premiums, 5 Sayles Hall, 2.30 p.m.
November 30.	*Thursday.* Thanksgiving Day. No University exercises.
Dec. 22, 1911, to January 2, 1912.	*Friday to Tuesday.* Christmas Recess.

1912

January 23.	*Tuesday.* Last day for applications of competitors for the Carpenter Prizes in Elocution.
Jan. 29 to Feb. 8.	*Monday to Thursday.* Term examinations.
February 9–13.	*Friday to Tuesday.* Mid-year Recess.

February 12, 13.	*Monday and Tuesday.* Enrolment of Undergraduate students.
February 14.	*Wednesday.* Second Term begins.
February 22.	*Thursday.* Washington's Birthday. No University exercises.
March 26.	*Tuesday.* Last day for receiving essays submitted in competition for the Gaston Prize Medal.
March 30.	*Saturday.* Last day for receiving applications for examination for the degree of Doctor of Philosophy, or of Master of Arts *in absentia.*
April 3–9.	*Wednesday to Tuesday.* Spring Recess.
April 13.	*Saturday.* Last day for receiving applications for the Grand Army of the Republic Fellowship.
April 27.	*Saturday.* Last day for receiving theses of candidates for the degree of Doctor of Philosophy. Last day for receiving Commencement orations.
April 30.	*Tuesday.* Carpenter Prize Speaking Competition.
May 4.	*Saturday.* Last day for receiving essays submitted in competition for the Bishop McVickar prizes.
May 7.	*Tuesday.* Gaston Prize Medal Competition.
May 14.	*Tuesday.* Hicks Prize Debate.
May 30.	*Thursday.* Memorial Day. No University exercises.
May 31.	*Friday.* Last day for examinations for advanced degrees.
June 4–14.	*Tuesday to Friday.* Term examinations.
June 16.	*Sunday.* Baccalaureate Sermon, First Baptist Meeting House, 4.30 p.m.
June 17.	*Monday.* Class Day.
June 18.	*Tuesday.* Annual Meeting of the Phi Beta Kappa Society, Administration Building, 9.30 a.m. Ivy Day, Pembroke Hall. Annual Meeting of the Associated Alumni, Manning Hall, 2.30 p.m.

June 19.	*Wednesday.* One Hundred and Forty-Fourth Annual Commencement (third Wednesday in June), First Baptist Meeting House, 10 a.m.
June 20.	*Thursday.* Meeting of the Corporation.
June 20 to Sept. 24.	Summer Vacation.
September 4.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
September 18–23.	*Wednesday, Thursday, Friday, Saturday, and Monday.* Examinations for admission to the Freshman class and to advanced standing.
September 23, 24.	*Monday and Tuesday.* Registration of new students and enrolment of students previously in residence.
September 25.	*Wednesday.* Academic Year begins (fourth Wednesday in September).

ADMISSION TO THE UNIVERSITY‡

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METHODS OF ADMISSION TO THE FRESHMAN CLASS

I. ENTRANCE EXAMINATIONS CONDUCTED BY THE UNIVERSITY. Examinations for admission to the Freshman class are given by the University in September at the times and places indicated below. The University no longer offers entrance examinations in June; candidates desiring to be examined in June must take the examinations conducted under the supervision of the College Entrance Examination Board, for which see pages 7, 8. A candidate may, at his option, take all his examinations in June or in September, or he may take part in June and part in September. Before taking any examination conducted by the University, a candidate must present to the Registrar a letter of recommendation from the principal of his preparatory school and secure a card admitting him to the examination. This may be done by correspondence, provided that the written application and the recommendation are received not less than one week before the date of the first examination.

If a candidate offers subjects in excess of those required for admission, he may be examined in them at the times scheduled below and receive credit for them as college studies.

Any of these examinations may be taken one year before the candidate expects to enter college.

The order of the examinations in 1911 will be as follows:

WEDNESDAY, SEPTEMBER 20
Algebra, 27 Wilson Hall, 8 a.m. to 10 a.m.
Plane Geometry, 27 Wilson Hall, 10 a.m. to 12 m.
Elementary French, 26 Wilson Hall, 1 p.m. to 3 p.m.
Advanced French, 2 Wilson Hall, 3.30 p.m. to 5.30 p.m.

THURSDAY, SEPTEMBER 21
English A, 26 Wilson Hall, 8 a.m. to 9.30 a.m.
English B, 26 Wilson Hall, 9.30 a.m. to 11 a.m.
Elementary Latin, 25 Wilson Hall, 12 m. to 2 p.m.
Advanced Latin, 25 Wilson Hall, 2 p.m. to 3.30 p.m.
American History, 27 Wilson Hall, 4 p.m. to 6 p.m.

FRIDAY, SEPTEMBER 22
Elementary German, 2 Wilson Hall, 8 a.m. to 10 a.m.
Advanced German, 2 Wilson Hall, 10 a.m. to 12 m.

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‡ Students entering in 1911 or 1912 may offer either the old or the new requirements. After 1912 the new requirements only will be accepted. For full information see the Catalogue 1910–1911.

Chemistry, 2 Wilson Hall, 1 p.m. to 3 p.m.
Astronomy, 27 Wilson Hall, 3.15 p.m. to 5.15 p.m.
Physiography, 27 Wilson Hall, 5.30 p.m. to 7.30 p.m.

SATURDAY, SEPTEMBER 23
Plane Trigonometry, 27 Wilson Hall, 8 a.m. to 10 a.m.
Solid Geometry, 27 Wilson Hall, 10 a.m. to 12 m.
Botany, 2 Wilson Hall, 8 a.m. to 10 a.m.
Greek and Roman History, 25 Wilson Hall, 1 p.m. to 3 p.m.
Physics, 1 Wilson Hall, 4 p.m. to 6 p.m.

MONDAY, SEPTEMBER 25
Elementary Greek, 2 Wilson Hall, 8 a.m. to 10 a.m.
Advanced Greek, 2 Wilson Hall, 10 a.m. to 11.30 a.m.
English History, 25 Wilson Hall, 12.30 p.m. to 2.30 p.m.
Medieval and Modern History, 26 Wilson Hall, 3 p.m. to 5 p.m.

For students already pursuing courses in the University, entrance examinations are also given by the University at the close of the Christmas recess. Students desiring to take these examinations must file written applications with the Registrar before December 1. No student who has failed in an entrance examination will be granted a second examination at any time other than September, except on presentation of a tutor's certificate that he is prepared for such examination and on payment of a fee of two dollars. No entrance examinations other than those appointed above will be held unless ordered by vote of the Committee on Registration and Attendance.

II. ENTRANCE EXAMINATIONS CONDUCTED BY THE COLLEGE ENTRANCE EXAMINATION BOARD. Examinations conducted under the supervision of the College Entrance Examination Board will be accepted in place of the corresponding examinations conducted by Brown University. In 1911 these examinations will be held June 19–24.

All applications for these examinations must be addressed to the Secretary of the College Entrance Examination Board, Post Office Sub-Station 84, New York, and must be made upon a blank form to be obtained from the Secretary of the Board. Applications for examination at points in the United States east of the Mississippi River, also at Minneapolis, St. Louis, and other points on the Mississippi River, must be received by the Secretary of the Board on or before Monday, June 5, 1911; application for examination elsewhere in the United States or in Canada must be received on or before Monday, May 29, 1911; and applications for examinations at points outside the United States and Canada must be received on or before Monday, May 15, 1911. Applications received later than the dates named will be accepted when it is possible to arrange for the examinations of the candidates concerned, but only upon the payment of $5 in addition to the regular fee.

The examination fee is $5 for all candidates examined at points in the United States and Canada, and $15 for all candidates examined at points outside of the United States and Canada. The fee (which cannot be accepted in advance of the application) should be remitted by postal order, express order, or draft on New York, to the order of the College Entrance Examination Board.

A list of the places at which examinations are to be held by the Board in June, 1911, will be published about March 1. Requests that the examinations be held at particular points, to receive proper consideration, should be transmitted to the Secretary of the Board not later than February 1.

III. ADMISSION BY CERTIFICATE. Students are admitted upon presentation of a certificate signed by the principal of any school which has the privilege of issuing certificates to Brown University.

Principals of schools in New England who desire the certificate privilege for Brown University, or for any other college represented on the New England College Entrance Certificate Board, should address the Secretary of the Board, Professor Nathaniel F. Davis, 159 Brown Street, Providence, R. I., who will furnish the necessary application blanks. These blanks must be returned to him before April 1 of the year for which the certificate privilege is desired.

The principals of schools situated outside of New England who desire the certificate privilege must make application to the Registrar of the University before May 1, and must furnish satisfactory evidence that the course of study in the school meets the requirements for admission. Blank forms for this purpose will be supplied on request. Certificates from the New York Board of Regents are accepted for the specified subjects so far as they coincide with the entrance requirements of Brown University.

Certificates are accepted for admission to the Freshman class only, not for admission to advanced standing. If any candidate offers subjects in excess of those required for admission, he may be examined in them at the times indicated on pages 6, 7, and receive credit for them as college studies.

Blank forms for the certification of candidates may be obtained from the Registrar by the principals of schools having the privilege of certification. These forms should be filled out and returned to him by July 1. When a student has attended more than one school, a letter of recommendation from the principal of the school last attended must accompany the certificate.

REGISTRATION AND ENROLMENT OF UNDERGRADUATES

REGISTRATION. In September of each year all new students, whether candidates for a degree or special students, must report at the Administration Building between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first semester, and fill out registration cards for the whole of the ensuing year. Failure to comply with this rule will be treated as late registration and a fee of three dollars will be charged. All new students must present at or before the time of registration all credentials necessary for admission as candidates for a degree or as special students.

In May of each year all undergraduates in residence, whether candidates for a degree or special students, must obtain at the Registrar's office registration cards for the next year; these cards must be filled out by the students with a statement of the courses elected for the whole of the ensuing year, and returned not later than June 1. Failure to comply with this rule will be treated as late registration and a fee of three dollars will be charged.

When semester courses are grouped in one paragraph (*e.g.* Botany 1, 2), the second semester may not be taken without the first, unless specific statement to the contrary is made. In starred courses a final mark will be given at the end of the course, the mark given at the end of the preceding semester being regarded as temporary. Changes in registration will be allowed only on presentation of sufficient reasons to the Committee on Registration and Attendance. Requests for permission to make changes in September must be presented to the committee between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first semester. Requests for permission to make changes for the second semester must be presented to the committee before the beginning of the examinations of the first semester, unless these requests are the result of failures, in which case they must be presented in writing to the Registrar two days before the opening of the second semester.

ENROLMENT. All students must report at the Registrar's office between 9 a.m. and 5 p.m. on one of the two days preceding the opening of each semester and have their names checked as enrolled. Failure to report will be treated as late enrolment and a fee of three dollars will be charged.

GRADUATE STUDENTS

Graduate students must report to the Dean of the Graduate Department in No. 5 Wilson Hall between 9 a.m. and 1 p.m. or between 3 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of each semester. Before entering classes they must present their registration cards at the Registrar's office and be enrolled.

UNIVERSITY FEES

FEES FOR UNDERGRADUATES. *Tuition:* $52.50 a semester; $105 a year. *Incidentals:* $24 a semester; $48 a year. *Matriculation fee* (Freshman year only): $5. *Graduation fee* (Senior year only): $8.

The incidental expenses are for the printing of programs, examination papers, and the like, the use of the library and the gymnasium, heat for these buildings and for the recitation rooms, and the wages of servants to care for them.

Special students who are taking courses amounting to less than fifteen hours a week pay in proportion to the actual amount taken.

FEES FOR RESIDENT GRADUATE STUDENTS. *Tuition:* $75 a semester; $150 a year. *Graduation fee:* for the degree of Master of Arts, $15; for the degree of Master of Science, $15; for the degree of Doctor of Philosophy, $25.

Graduate students who are taking courses amounting to less than fifteen hours a week pay $15 a semester for each three-hour course.

A candidate in residence for the degree of Master of Arts or Master of Science who has paid full tuition for one year may, if necessary to the attainment of his degree, continue his studies for one year more without additional charge.

A candidate in residence for the degree of Master of Arts, who without remitting his studies becomes a candidate for the degree of Doctor of Philosophy, is credited with whatever tuition he has already paid, in case his previous work is allowed to count toward the higher degree.

A candidate for the degree of Doctor of Philosophy who has paid full tuition for two years may, if necessary to the attainment of his degree, continue his studies for two years more without additional charge.

FEES FOR NON-RESIDENT GRADUATE STUDENTS. *Registration fee:* $25. *Tuition:* $15 a semester; $30 a year. *Examination fee:* $15.

A non-resident candidate is entitled, upon payment of the registration and tuition fees, to take one three-hour course in residence. For each additional course taken in residence a fee of $15 a semester is charged.

A non-resident candidate who has paid tuition for two years may, if necessary to the attainment of his degree, continue his studies for one year more without additional charge, except for work taken at the University.

LABORATORY FEES. In addition to the regular fees mentioned above the following fees are charged for laboratory courses. These fees cover the cost of ordinary supplies; special supplies and breakage are charged extra. $4.50 for each three-hour semester course in *Botany, Biology, Geology, Elementary Chemistry.* $7.50 for each three-hour semester course in *Advanced Chemistry, Mechanical Engineering, Physics, Electrical Engineering.*

SPECIAL FEES. Candidates for a first degree who do not pay four years full tuition fees must pay for all extra courses counted toward the degree at the rate of $7.50 per semester for each three-hour course. This amount must be paid at the beginning of the semester preceding the completion of the degree work. This rule does not apply to courses credited from other institutions or taken during the summer.

Candidates for the degree of A.M. or Sc.M. who do not pay full tuition fees for one year, and candidates for the degree of Ph.D. who do not pay full tuition fees for two years, must pay for all extra courses counted toward the degree at the rate of $7.50 per semester for each three-hour course. This amount must be paid at the beginning of the semester preceding the completion of the degree work. This rule does not apply to courses credited from other institutions.

PAYMENT OF TERM BILLS

Every student, graduate or undergraduate, must pay in advance, at registration for each semester, all charges for tuition and incidentals for such semester.

Students occupying dormitory rooms must also pay at the above time all room charges for the semester.

Students taking laboratory courses must also pay at the above time all laboratory fees for the semester. These fees vary from $4.50 to $7.50 for each three-hour laboratory course.

At the beginning of the second semester all students occupying dormitory rooms or taking laboratory courses must, in addition to the payment of the above amounts, make a deposit of $5 toward charges for light or breakage during that semester.

Freshmen, candidates for degrees, must pay at registration for the first semester a matriculation fee of $5.

Candidates for graduation in any year must pay all graduation fees at the beginning of the second semester of that year.

REQUIREMENTS FOR DEGREES

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REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ARTS

I. PRESCRIBED SUBJECTS

Ancient Languages (either Latin or Greek, or both). Six hours. At least three hours must be taken in the Freshman year, and the six hours must be completed by the end of the Sophomore year.

Modern Languages (either French or German, or both). Six hours. At least three hours must be taken in the Freshman year, and the six hours must be completed by the end of the Sophomore year.

Students presenting elementary French only must continue French in the Freshman year and take elementary German in either the Freshman or the Sophomore year. Students presenting elementary German only must continue German in the Freshman year and take elementary French in either the Freshman or the Sophomore year. Students presenting elementary French and elementary German only must continue both languages, but may postpone the continuation of one language until the Sophomore year. Students presenting elementary work in one language and elementary and advanced work in the other must take in the Freshman year the language in which the elementary work only was presented. Students presenting elementary and advanced work in both languages may take the required six hours in either French or German, or both.

Modern Languages (for students entering in 1911). Six hours. In at least one modern language the equivalent of the elementary and intermediate requirement for admission must be taken, or such portion of this requirement as was not presented for admission, and one year course (three hours) additional.

Students already in college will be permitted, if they desire, to substitute the new for the present requirement in Modern Languages.

Mathematics. Three hours. Freshman year.

English. Rhetoric and Composition. Three hours. Freshman year.

European History. Three hours. Sophomore or Junior year.

English Literature. Three Hours. Sophomore, Junior, or Senior year.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Social and Political Science, and Economics. One three-hour course continuous through the year. Sophomore, Junior, or Senior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. Required Studies. *Latin* or *Greek*, three hours; *French* or *German*, three hours; *Mathematics*, three hours; *English*, three hours.

II. Elective Studies. One three-hour course continuous through the year must be chosen from the following list: *Latin*, *Greek*, *French*, *German*, *Classical Civilization*, *Chemistry*, *Botany*, *Biology*, *Geology*, *Mechanical Drawing.*

SOPHOMORE YEAR

That portion of the required work in ancient and modern languages not completed in the Freshman year, and other required and elective courses sufficient to make a total of fifteen hours a week.

JUNIOR YEAR

The required History and Physical or Natural Science, if not previously taken, and other required and elective courses sufficient to make a total of fifteen hours a week.

SENIOR YEAR

All required courses not previously taken, and elective courses sufficient to make a total of fifteen hours a week.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF PHILOSOPHY‡

For Students now in the University

I. PRESCRIBED SUBJECTS

Modern Languages. An amount sufficient, with the work presented for admission, to complete the elementary course and a year of advanced work in both French and German. A student who is admitted in both advanced French and advanced German must continue one of these languages for one year, three hours a week.

Mathematics. Three hours. Freshman year.

English. Rhetoric and Composition. Three hours. Freshman year.

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‡ Candidates for the Degree of Bachelor of Philosophy now in college may take advantage of the new Requirements for Concentration, may substitute the new for the present requirements in Modern Languages, and, with the consent of both departments concerned, may substitute a course in Argumentation for the required Mathematics. See pages 14–17.

European History. Three hours. Sophomore or Junior year.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year.

II. REQUIREMENTS ARRANGED BY YEARS

SOPHOMORE YEAR

That portion of the required work in modern languages not completed in the Freshman year, and other required and elective courses sufficient to make a total of fifteen hours a week.

JUNIOR YEAR

The required History and Physical or Natural Science, if not previously taken, and other required and elective courses sufficient to make a total of fifteen hours a week.

SENIOR YEAR

All required courses not previously taken, and elective courses sufficient to make a total of fifteen hours a week.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF PHILOSOPHY

For Students entering in 1911

I. PRESCRIBED SUBJECTS

A continuous course of three hours through the year in each of the following subjects:

Mathematics. This subject may be omitted by students who elect to take Argumentation in the Sophomore year.

English. Rhetoric and Composition. Freshman year.

French or German. In at least one modern language the equivalent of the elementary and intermediate requirement for admission must be taken, or such portion of this requirement as was not presented for admission, and one year course (three hours) additional.

General Biology. Freshman or Sophomore year.

Physics, Chemistry, Geology, or Astronomy. This requirement does not apply to students who present Physics and Chemistry for admission. *Chemistry or Geology.* Freshman or Sophomore year. *Physics or Astronomy.* Sophomore year. Only one of this group required.

Philosophy. Sophomore, Junior, or Senior year.

English Literature. Freshman or Sophomore year.

European History. Freshman, Sophomore, or Junior year.

Social and Political Science and Economics. Sophomore, Junior, or Senior year.

Argumentation (for students who do not take Mathematics). Sophomore year.

Classical Civilization. Freshman or Sophomore year. Freshman year for students who do not take Mathematics.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. Required Studies. *English* 1; *French or German* (a course in continuation of a course presented for admission); *Mathematics* 1 b, 2 b, or 3, 4, or 5, 6 (for students who do not elect to take the course in Argumentation in the Sophomore year); *Classical Civilization* (for students who do not take Mathematics); *General Biology, Chemistry, or Geology.*

II. Elective Studies. One three-hour course continuous through the year must be chosen from the following list: *Latin, Greek, French, German, Classical Civilization, History, English Literature, Chemistry, Botany, Biology, Geology, Mechanical Drawing.*

SOPHOMORE YEAR

That portion of the required work in modern languages not completed in the Freshman year.

General Biology; for students who have not taken this course in the Freshman year.

Physics, Chemistry, Astronomy, or Geology; for students who have not presented Physics and Chemistry for admission or taken a course in Physical Science in the Freshman year.

Argumentation; for students who have not taken Mathematics in the Freshman year.

Classical Civilization; for students who have not taken this subject in the Freshman year.

English Literature; for students who have not taken English 11 in the Freshman year.

Other required and elective courses sufficient to make a total of fifteen hours a week.

JUNIOR YEAR

The required History, if not previously taken, and other required and elective courses sufficient to make a total of fifteen hours a week.

During the Junior and Senior years a student must take at least four courses outside the department chosen for special work. See Requirements for Concentration, below.

SENIOR YEAR

All required courses not previously taken, and elective courses sufficient to make a total of fifteen hours a week.

III. REQUIREMENTS FOR CONCENTRATION

At the close of the Sophomore year each student must choose from the following list a department in which he intends to do special work during the Junior and Senior years, and must elect at least three courses of three hours a year each in this department. If he has not already taken a three-hour year course in the department chosen, he must elect four courses.

These courses must be selected in consultation with the head of the department and must be approved by him. When two departments are combined, the selection must be made in consultation with the head of the department first named.

At any time prior to the beginning of the Senior year a student may, with the approval of the Committee on Registration and Attendance, change the department in which he is to do his special work.

With the approval of the department in which the student is doing special work, he may count as the equivalent of one course, work which does not require regular class-room attendance.

LIST OF DEPARTMENTS IN WHICH SPECIAL WORK MAY BE TAKEN

Art.
Art, and Greek Literature and History.
Art, and Roman Literature and History.
Art, and Music.
Art, and History.
Astronomy.
Astronomy, and Civil Engineering.
Astronomy, and Physics.
Astronomy, and Mathematics.
Astronomy, and Geology.
Biblical Literature and History.
Biblical Literature and History, and Greek Literature and History.
Biblical Literature and History, and Philosophy.

Biology.
Botany.
Botany, and Biology.
Chemistry.
Civil Engineering.
Economics.
Education.
Education, and Philosophy.
Education, and Social and Political Science.
Education, and History.
Electrical Engineering.
English.
Geology.
Germanic Languages and Literatures.
Greek Literature and History.
Greek Literature and History, and Roman Literature and History.
Greek Literature and History, and Biblical Literature and History.
Greek Literature and History, and Indo-European Philology.
Greek Literature and History, and Art.
History.
Mathematics.
Mechanical Engineering.
Mechanics, and Mechanical Drawing.
Mechanics, and any Engineering department.
Philosophy.
Physics (exclusive of Electrical Engineering).
Roman Literature and History.
Roman Literature and History, and Art.
Roman Literature and History, and Greek Literature and History.
Roman Literature and History, and Indo-European Philology.
Romance Languages and Literatures.
Social and Political Science.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN CIVIL ENGINEERING

FRESHMAN YEAR

First Semester	*Second Semester*
Mathematics 17	Mathematics 18
Mech. Drawing 1	Mech. Drawing 2
English 1	English 2

and two of the following courses, Chemistry (if not presented for admission), French, German, subject to the direction of the Committee on Registration and Attendance.

Note. A student who presents three units in one foreign language for admission is not obliged to take a course in that language in college, but may elect any course he desires, subject to the approval of the head of the Department of Civil Engineering.

SOPHOMORE YEAR

First Semester	*Second Semester*
Mathematics 19	Mathematics 20
Mech. Drawing 3	Mech. Drawing 4
Civil Engineering 1	Civil Engineering 2
Physics 1	Physics 2
‡Economics 1	‡Soc. and Pol. Science 1
	§Civil Engineering 4
	Civil Engineering 6

JUNIOR YEAR

Civil Engineering 7	Civil Engineering 8
Mechanics 1	Mechanics 2
Geology 3	Geology 4
Physics 21	Physics 22
Mech. Engineering 19	Mech. Engineering 20
Astronomy 5	Civil Engineering 10
	Civil Engineering 12

SENIOR YEAR

Civil Engineering 9	Civil Engineering 20
Civil Engineering 13	Civil Engineering 22
Civil Engineering 15	Civil Engineering 24
Civil Engineering 17	Civil Engineering 26
Civil Engineering 19	Civil Engineering 28
Civil Engineering 35	Civil Engineering 30
Elect. Engineering 1	Civil Engineering 32
	Civil Engineering 34
	Civil Engineering 35
	Mech. Engineering 24
Mechanics 3	Mechanics 4

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‡Or some other year course, in the Department of English, or History, or Philosophy, chosen with the approval of the head of the Department of Civil Engineering.

§Civil Engineering 3 is taken during the spring recess.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

FRESHMAN YEAR

First Semester	*Second Semester*
Mathematics 17	Mathematics 18
Mech. Drawing 1	Mech. Drawing 2
English 1	English 2

and two of the following courses, Chemistry (if not presented for admission), French, German, subject to the direction of the Committee on Registration and Attendance.

Note. A student who presents three units in one foreign language for admission is not obliged to take a course in that language in college, but may elect any course he desires, subject to the approval of the head of the Department of Electrical Engineering.

SOPHOMORE YEAR

Mathematics 19	Mathematics 20
Mech. Drawing 3	Mech. Drawing 4
Mech. Drawing 5	Mech. Engineering 8
Physics 1	Physics 2
‡ Economics 1	‡ Soc. and Pol. Science 1
Mech. Engineering 1	Mech. Engineering 2

JUNIOR YEAR

Mechanics 1	Mechanics 2
Mech. Engineering 9	Mech. Engineering 10
Physics 21	Physics 22
Elect. Engineering 1	Elect. Engineering 2
Mech. Engineering 3	Elect. Engineering 6
Mech. Engineering 19	Mech. Engineering 20

SENIOR YEAR

Mechanics 3	Mechanics 4
Mathematics 9a	Elect. Engineering 8
	Elect. Engineering 10
Physics 13	Physics 14
Elect. Engineering 3	Elect. Engineering 12
Elect. Engineering 7	Elect. Engineering 4
Mech. Engineering 15	Mech. Engineering 16
	Civil Engineering 26
Elect. Engineering 13	Elect. Engineering 14
	Mech. Engineering 24

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‡ Or some other year course, not technical, chosen with the approval of the head of the Department of Electrical Engineering.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

FRESHMAN YEAR

First Semester	*Second Semester*
Mathematics 17	Mathematics 18
Mech. Drawing 1	Mech. Drawing 2
English 1	English 2

and two of the following courses, Chemistry (if not presented for admission), French, German, subject to the direction of the Committee on Registration and Attendance.

NOTE. A student who presents three units in one foreign language for admission is not obliged to take a course in that language in college, but may elect any course he desires, subject to the approval of the head of the Department of Mechanical Engineering.

SOPHOMORE YEAR

Mathematics 19	Mathematics 20
Mech. Drawing 3	Mech. Drawing 4
Mech. Drawing 5	Mech. Engineering 8
Physics 1	Physics 2
‡ Economics 1	‡ Soc. and Pol. Science 1
Mech. Engineering 1	Mech. Engineering 2

JUNIOR YEAR

Mech. Engineering 19	Mech. Engineering 20
Mech. Engineering 15	Mech. Engineering 16
Mech. Engineering 3	Mech. Engineering 4
Mech. Engineering 9	Mech. Engineering 10
Mechanics 1	Mechanics 2
Physics 21	Physics 22

SENIOR YEAR

Mech. Engineering 21	Mech. Engineering 22
Mech. Engineering 5	Mech. Engineering 14
Mech. Engineering 17	Mech. Engineering 18
Mechanics 3	Mechanics 4
Elect. Engineering 1	Elect. Engineering 2
Mech. Engineering 11	Mech. Engineering 12
	Mech. Engineering 24
Mech. Engineering 25	Mech. Engineering 26
	Civil Engineering 26

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‡ Or some other year course, in the Department of English, or History, or Philosophy, chosen with the approval of the head of the Department of Mechanical Engineering.

COURSES OF INSTRUCTION

WHEN semester courses are grouped in one paragraph (e.g. *Art 1, 2*), *the second semester may not be taken without the first unless specific statement to the contrary is made. In starred courses a final mark covering the work of the course as a whole is given at the end of the course, the marks given at the end of the first semester being regarded as temporary. When the time of meeting is not announced, it will be arranged by the instructor at the beginning of the semester.*

I. ART‡

WILLIAM CAREY POLAND, A.M., LITT.D., *Professor of the History of Art*

1, 2. *History of Art from Antiquity through the Renaissance*

First semester, ancient art, chiefly Greek and Roman. Second semester, Early Christian, Byzantine, Romanesque, and Gothic art, and the art of the fifteenth and sixteenth centuries; the effect on art of the dominant motives of the epoch, the development of art in the different countries of Europe, the great masters and their most significant works. Text-book, lectures, lantern views. Students who elect this course are advised to elect also, if possible, courses 17, 18, *Practical Work in Art.*

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Each semester may be elected independently. *Mon., Wed., Th., at 10.20.*

3, 4. *Modern Art, and Theory and Criticism of the Fine Arts*

First semester, the seventeenth and eighteenth centuries. Second semester, the nineteenth century, with a study of the more important facts and laws of artistic production. Text-book, lectures, special assigned topics, lantern views.

Three hours. Through the year. Course 3 is elective for students who have completed 2. Course 4 is elective for students who have completed 1, or 2, or 3.

5, 6. *Renaissance Art, Advanced Course*

Critical study of the art of the fifteenth and sixteenth centuries, particularly Italian. A more detailed study of the spiritual conditions, the influences, and the masters, than in 2.

Three hours. Through the year. Elective for students who have credit for 2. *Mon., Th., Fri., at 9.20.*

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‡For arrangements with the Rhode Island School of Design, see the Catalogue, page 178.

7, 8. *Seminary in Greek and Roman Sculpture*

An archaeological course based on Overbeck's *Schriftquellen.*

Three hours. Through the year. Elective for Graduates who read Greek and Latin. Offered if three or more elect the course. It is advised that application be made to Professor Poland at an early date.

[9. *Seminary Study of the Acropolis of Athens*]

Critical reading, in Greek, of Pausanias' account of the Acropolis of Athens; lectures and illustrations.

Three hours. First semester. Elective for Graduates who read Greek and Latin. Not offered in 1911–12.

[10. *Seminary in Classical Architecture*]

Critical study; reading of Vitruvius in Latin; discussion of the principles followed by the Greek and Roman architects, and of the influence of Vitruvius upon the Renaissance.

Three hours. Second semester. Elective for Graduates. Not offered in 1911–12.

15, 16. *Freehand Drawing*

Training of hand and eye by study in charcoal and pencil of casts and still-life objects.

One hour. Two hours of drawing. Through the year. Elective for all students. Given at the Rhode Island School of Design. Hours to be arranged with the Director.

17, 18. *Advanced Drawing and Color Work*

Practical work in light and shade, and in color.

Three hours. Six hours of drawing, or four hours of drawing and one hour lecture on Historic Ornament. Through the year. Elective for students who have credit for 15, 16, and who have taken or are taking 1, 2. Given at the Rhode Island School of Design. *Mon., Tu., Wed., at 2.* Lecture hour as arranged by the Rhode Island School of Design.

19, 20. *Architectural Design*

Principles of architectural design and composition taught by means of lectures, problems in design, and working drawings.

Three hours. One hour of recitation and four hours of drawing. Through the year. Elective for students who have credit for Mechanical Drawing 3, 4. Given at the Rhode Island School of Design by Mr. HUGER ELLIOTT, Director. *Mon. at 3.* Drawing hours to be arranged with the Director.

II. ASTRONOMY

Winslow Upton, A.M., Sc.D., *Professor of Astronomy*
John Edwards, *Assistant in the Ladd Observatory.*

1. *General Course*

Designed for general culture and preparation for technical work. Fundamental conceptions; methods of professional study. Chief topic: the movements of the heavenly bodies.

Three hours. First semester. Elective for Juniors and Seniors who have credit for Mathematics 1, 2. *Tu., Th., Fri., at 3.20.* Observations at Ladd Observatory. May be continued in the second semester by 2 or 4, or both, subject to the approval of the instructor.

2. *General Course (completed)*

Chief topics: the physical condition of the heavenly bodies; the sidereal universe.

Three hours. Second semester. Elective for students who have credit for 1. *Tu., Th., Fri., at 3.20.*

4. *Practical Astronomy*

Designed for students who wish technical work in observation and computation.

Three hours. Second semester. Elective for students who have credit for 1. Not given unless elected by four or more students.

5. *Field Astronomy*

The astronomical problems of geodesy: azimuth, time, latitude, longitude. Computations and observations.

Four hours. First semester. Required of candidates for the degree of Bachelor of Science in Civil Engineering. *Mon., Tu., Th., Fri., at 2.20.* Observations at Ladd Observatory.

7, 8. *Advanced Astronomy*

Designed for students who wish to specialize in Astronomy.

Three hours. Through the year. Elective for approved students who have credit for 2 or 4. Not given unless elected by four or more students.

9, 10. *Research Course*

Special advanced work. Subjects arranged to meet the requirements of individual students.

Elective for Graduates and approved Undergraduates.

III. BIBLICAL LITERATURE AND HISTORY‡

HENRY THATCHER FOWLER, PH.D., *Professor of Biblical Literature and History*

NATHAN STERN, PH.D., *Lecturer in Biblical Literature and History*

LANGUAGES

1, 2. *Elementary Hebrew*

Grammar; exercises in writing Hebrew; translation of parts of Genesis and Deuteronomy. *Dr.* STERN.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

3, 4. *Historical Hebrew*

Reading of the books of Samuel and Kings with special attention to the acquisition of a vocabulary; review of the elements of Hebrew grammar and study of syntax. *Dr.* STERN.

Three hours. Through the year. Elective for students who have credit for 1.

5, 6. *Hebrew Literature*

Psalm literature. Critical translation of the lyric poetry of the Old Testament, investigation of the characteristics and development of Hebrew poetry. In succeeding years corresponding courses in the Wisdom, Legal, and Prophetic literature of the Old Testament will be offered. *Professor* FOWLER.

Three hours. Through the year. Elective for Graduates and approved Undergraduates.

7. *Textual Criticism of the Old Testament*

The principles and method of textual criticism, in connection with the study of one of the shorter prophetical books. *Dr.* STERN.

Three hours. One semester. Offered if applied for by Graduates.

8. *Biblical Aramaic*

Grammar and reading of the Aramaic portions of the Old Testament. *Dr.* STERN.

Three hours. One semester. Offered if applied for by students who have credit for 1.

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‡ For conditions under which students may receive credit in the Newton Theological Institution for work done in this department, see the Catalogue, page 178.

9, 10. *Elementary Arabic*

Grammar; exercises in writing Arabic; translation of prose selections. *Professor* Fowler.

Two hours. Through the year. Elective for Seniors and Graduates.

11, 12. *Gospels and Epistles*

Characteristics of Hellenistic Greek; translation, and investigation of date, authorship, and thought. First semester, the Gospel and Epistles of John, the Gospel of Mark. Second semester, the Gospels of Matthew and Luke. *Professor* Fowler.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each semester may be elected independently. *Wed., Fri., Sat., at 11.20.*

[13, 14. *Acts and Pauline Epistles*]

First semester, Acts and Thessalonians. Second semester, Galatians, Corinthians, and Romans. *Professor* Fowler.

Not offered in 1911–12.

LITERATURE AND HISTORY IN ENGLISH ‡

[15, 16. *Old Testament Literature and History*]

First semester, early Semitic history, Hebrew literature and history to the close of the United Kingdom. Second semester, Hebrew and Jewish literature and history from the division of the kingdom to the conquest of Alexander. Includes nearly the entire Old Testament literature and history. In connection with 17, 18, gives a comprehensive view of Biblical literature and history. The books are read in the best English translations. *Professor* Fowler.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Not offered in 1911–12.

17, 18. *New Testament Literature and History*

First semester, Jewish literature and history from the beginning of the Greek period to the destruction of Jerusalem, the Gospels and other sources for the life of Christ. Second semester, outline of the life of Christ, literature and history of the Apostolic age. Includes a large part of the Jewish writings from the conquest of Alexander to the destruction of Jerusalem, and the entire New Testament, studied in its Jewish setting. Emphasis placed upon the connection between the literature and the history. In connection with 15, 16, gives a comprehensive view of Biblical literature and history. The books are read in the best English translations. *Professor* FOWLER.

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‡ Course 19, 20 gives a rapid survey of the Bible as a part of the world's literature. It is designed especially for those who do not expect to pursue further courses in this department.

Courses 15, 16 and 17, 18 are introductory to more detailed courses in the University or the Theological Seminary. They are also designed for those who, without intending to specialize in this field, desire a comprehensive view of the nature and results of the historical as well as the literary study of the Bible.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Each semester may be elected independently. *Mon.*, *Wed.*, *Th.*, *at 10.20.*

19, 20. *The English Bible as Literature*

An outline of the literary history of the Old and New Testaments; the literary forms represented in the Bible; the place of the Bible in English literature. Emphasis placed upon the literature itself and its connection with the present. Lectures and assigned readings from the English Bible. First semester, Old Testament literature from the beginning to the close of the Babylonian exile. Second semester, the completion of the Old Testament and the New Testament literature. *Professor* FOWLER.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Each semester may be elected independently. *Mon.*, *Tu.*, *Th.*, *at 11.20.*

21, 22.* *Biblical Seminary*

Subject for 1911–12: The teachings of Jesus. *Professor* FOWLER.

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors.

23. *Principles of Historical Criticism and Research*

This course is the same as course 19 offered by the Department of History. *Professor* MACDONALD.

One hour. One semester. Elective for Graduates of one year's standing. Required of all candidates for the degree of Doctor of Philosophy in Biblical Literature and History.

IV. BIOLOGY

Albert Davis Mead, Ph.D., *Professor of Biology*
Frederic Poole Gorham, A.M., *Associate Professor of Biology*
Herbert Eugene Walter, Ph.D., *Assistant Professor of Biology*
Philip Henry Mitchell, Ph.D., *Instructor in Physiology*
John Burnham Ferguson, A.B., M.D., *Demonstrator in Anatomy*

1, 2. *General Biology*

The structure of animals and plants; elementary vital phenomena; the functions of organs; the development of organisms; classification. An outline of the more important biological theories, such as evolution, natural selection, variation, mutation and heredity, and the principles upon which modern hygiene and sanitation are based. The course will introduce the student to the use of the microscope, laboratory technic, and to scientific methods of observation and experiment. *Professor* Gorham.

Three hours. Six hours of attendance. Through the year. Required in Freshman or Sophomore year of candidates for the degree of Bachelor of Philosophy beginning with the class entering in 1911. Elective for Undergraduates. *Lectures, Mon., Tu., Th., at 3.20. Laboratory, 1st div., Mon., Tu., Th., at 2.20; 2d div., Tu., Th., Sat., at 12.20.*

3, 4. *Comparative Anatomy of Vertebrates*

Intended not only for the general student, but also for those who are particularly interested in zoölogy and for those who expect to study medicine. The structure and significance of the various organs of vertebrates with particular reference to man. Students are permitted to attend clinics and autopsies at the Rhode Island Hospital. Laboratory work and lectures. *Professor* Walter.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1, 2. *Mon., Wed., Fri., at 8.*

5, 6. *Anatomy of the Nervous System*

A study of the gross and microscopic anatomy of the brain, nerves, and sense organs in man and other vertebrates. Designed particularly for those intending to study medicine or psychology. *Professor* Mead.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2.

7, 8. *Embryology and Histology*

The origin and the development of the individual body; the elementary structure of the adult organs. Practice in micro-technic. Adapted to the requirements of general students and of those intending to study medicine. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2. *Tu., Th., Sat., at 8.*

9, 10. *Advanced Histology and Pathology*

Advanced work in micro-technic and in normal and pathological histology. Adapted to individual requirements. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 1, 2, and 7, 8.

11, 12. *General Physiology*

General vital processes in plants and animals; the more special phenomena in higher animals, with their application to human physiology. Designed not only as an introduction to further work, but also as a general view of physiology. Lectures and laboratory work. *Dr.* MITCHELL.

Three hours. Six hours of attendance. Through the year. Must be preceded by 1, 2, and by Chemistry 1, 2. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department.

13, 14. *Chemical Physiology*

Designed for those who are interested in physiology either from a medical or a general standpoint, and for those who are specializing in chemistry and desire a knowledge of vital chemical processes. Includes: the chemistry of proteins, carbohydrates, and fats; the physiology of the digestive system, with the study of secretions and of artificial salivary, gastric, and pancreatic digestions; examination of blood, bile, and urine; the analysis of foods with special reference to milk. *Dr.* MITCHELL.

Three hours. Six hours of attendance. Through the year. Must be preceded by Chemistry 1, 2, and 10. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Tu., Fri., Sat., at 10.20.*

16. *Bacteriology*

A general discussion of bacteria in all their relations, with special attention in the laboratory to the methods of studying bacteria, including the isolation, systematic study, and determination of unknown species. Lectures and laboratory work. *Professor* GORHAM.

Three hours. Six hours of attendance. Second semester. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon., Wed., Th., at 10.20.*

17, 18. *Advanced Bacteriology*

Practical work in the preparation of culture media; methods of sterilization and disinfection; qualitative and quantitative biological examination of water, milk, air, soil, and sewage; study of certain pathogenic organisms, with the determination of their pathogenic properties, and the methods of bacteriological diagnosis of disease. Laboratory work and seminary. *Professor* GORHAM.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 16.

19. *Invertebrate Zoölogy.*

A study of the natural history of invertebrate animals, particularly marine forms, insects, and protozoa. Field work will constitute an important part of the course. *Professors* GORHAM *and* WALTER.

One hour. Two hours of attendance. First semester. Elective for Undergraduates. *Wed. at 2.20.*

20. *Ornithology*

A study of birds regarded as a group of living animals, in relation to their environment. Lectures and early morning field trips for the identification of wild birds during their spring migration. *Professor* WALTER.

One hour. Two hours of attendance. Second semester. Elective for Undergraduates.

22. *Evolution*

Designed particularly for those who have not studied biology. The history of biology, principles of classification, geographical distribution, heredity, natural selection, variation, Mendelism, and the relationship of man to the lower animals. Lectures and assigned reading. *Professor* MEAD.

Three hours. Second semester. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

[24. *Physiology*]

A general survey of the activities of living organisms with special reference to the human body, including some applications of modern physiology to healthful living. Lectures and assigned reading.

Three hours. Second semester. Elective for Juniors and Seniors. Not offered in 1911–12.

31, 32. *Human Anatomy*

A course in practical dissection. Students are permitted to attend clinics and autopsies at the Rhode Island Hospital. *Dr.* FERGUSON.

Three hours. Through the year. Elective for Graduates.

33, 34. *Biological Research*

Research work arranged to meet the requirements of individual students. *Professor* MEAD.

Three to twelve hours. Through the year. Elective for Graduates.

35, 36. *Advanced Physiology*

Laboratory work and seminary. *Dr.* MITCHELL.

Three to twelve hours. Through the year. Elective for Graduates who have sufficient knowledge of chemistry and physiology.

37, 38. *Bacteriological Research*

Research work arranged to meet the requirements of individual students. *Professor* GORHAM.

Three to twelve hours. Through the year. Elective for Graduates who have credit for 16 and 17, 18.

39, 40. *Biological Theories and Problems.*

Seminary course. *Professor* MEAD.

One to three hours. Through the year. Elective for Graduates.

41, 42. *Zoölogical Seminary*

Reading and discussion of German zoölogical literature selected with reference to the needs of individual students. *Professor* WALTER.

One to three hours. Through the year. Elective for Graduates.

V. BOTANY

James Franklin Collins, Ph.B., *Assistant Professor of Botany*

1, 2. *General Course*‡

A study of the general principles of anatomy and morphology, physiology and ecology, including natural history of plant groups and classification.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. *Mon., Tu., Th., 2.20 to 4.20.*

3, 4. *Histology and Physiology*

Minute structure and special functions of plants and their tissues, embryology, cytology, microtechnic, etc. The work of the second semester can usually be arranged to meet the needs of students intending to take up medicine, forestry, etc.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1, 2, and for approved Graduates. Alternates with 5, 6. Not to be offered in 1912–13.

[5, 6. *Comparative Morphology*]

Intended to give a general view of the evolution and classification of plants by a comparative study of the life-histories of certain types. First semester, cellular plants (algae, fungi, mosses, etc.). Second semester, vascular plants (ferns, seed-plants, etc.).

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1, 2, and for approved Graduates. Alternates with 3, 4. Not offered in 1911–12. To be offered in 1912–13.

7, 8. *Advanced Course*

Special work on various phases of botany arranged to meet the requirements of individual students. May be taken in successive years. Students electing this course must plan it definitely, in consultation with the instructor, before June 1 of the preceding academic year.

One or more hours. Through the year. Each semester may be elected independently. Elective for Graduates, and for approved Juniors and Seniors.

10. *Trees*

Aims to familiarize the student with the more common native and introduced trees. Lectures and field work. The required field trips will take place in the afternoon unless otherwise arranged.

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‡ Students who have taken the one-term course formerly scheduled as Botany 1, may re-elect Botany 1 on the new basis, with the understanding that special or extra work will be assigned to replace all identical portions of the course.

One hour. Two hours of attendance. Second semester. Elective for Undergraduates. *Wed. at 8.*

VI. CHEMISTRY

JOHN HOWARD APPLETON, A.M., SC.D., *Newport-Rogers Professor of Chemistry*
JOHN EMERY BUCHER, PH.D., *Associate Professor of Organic Chemistry*
MOSES LEVEROCK CROSSLEY, SC.M., *Instructor in Chemistry*
NORMAN EDWARD HOLT, A.B., *Instructor in Chemistry*
ROBERT FOSTER CHAMBERS, SC.M., *Assistant in Chemistry*
ALBERT POTTER FARWELL, PH.B., *Assistant in Chemistry*

1, 2. *Descriptive Chemistry* ‡

Non-metals; metals, their metallurgy, compounds, and practical applications; theoretical chemistry. Lectures with experiments; written exercises; individual laboratory work. *Professor* BUCHER, *Messrs.* HOLT *and* CHAMBERS.

Three hours. Through the year. Elective for Undergraduates. *1st div., Mon., Th., at 10.20; 2d div., Tu., Fri., at 10.20; 3d div., Wed., Sat., at 11.20.* Laboratory hours to be arranged with the instructor.

3, 4. *Qualitative and Quantitative Analysis*

Properties of the metallic elements; their separation from certain of their compounds. Laboratory work; recitations in qualitative analysis and in chemical philosophy; exercises in stoichiometry. The principal non-metals and the acids formed by them; methods of separation and recognition of acids and acid radicles. Quantitative precipitations and separations of the most important elements and compounds; the principles upon which quantitative apparatus is constructed; chemical philosophy and stoichiometry continued. Chiefly laboratory work. *Professor* APPLETON *and Mr.* CROSSLEY.

‡ Credit for the entrance requirement in Chemistry admits only to 1, 2, which may be taken also without previous preparation. Students who wish to enter more advanced courses without taking 1, 2, must pass a special test at the time of the entrance examination in Chemistry. This test will cover the following topics: 1. All of the non-metals with their principal compounds and the processes of manufacture of the chief commercial products from non-metals. 2. About thirty important metals, their occurrence, preparation from the ore, the preparation and uses of their chief compounds. 3. The general principles of chemical action which depend upon physical laws. 4. Methods of making chemical computations of moderate difficulty. Preparation for this test may require the equivalent of six hours a week for one school year.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2. *1st div., Fri. at 11.20; 2d div., Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

5, 6. *Quantitative Analysis, Advanced Course*

Assaying of metallic ores; analysis of agricultural materials; testing of chemicals used in textile establishments, etc. *Professor* APPLETON *and Mr.* CROSSLEY.

Six hours. Twelve hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3, 4. Laboratory hours to be arranged with the instructor.

7, 8. *Organic Chemistry*

Preparation and analysis of representative organic compounds. Lectures, recitations, and laboratory work. *Professor* BUCHER *and Mr.* HOLT.

Six hours. Through the year. Lectures and laboratory work. Elective for approved Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

10. *Assaying*

Professor APPLETON *and Mr.* CROSSLEY.

Six hours. Twelve hours of attendance. Second semester. Elective for Seniors and Graduates who have credit for 1–4.

12. *Organic Dyes*

The chemistry and use of mordants, dyes, etc. *Professor* APPLETON *and Mr.* CROSSLEY.

Six hours. Twelve hours of attendance. Second semester. Elective for approved Seniors and Graduates.

13, 14. *Industrial Chemistry*

Lectures and laboratory work. *Professor* APPLETON.

Three to six hours. Six to twelve hours of attendance. Through the year. Elective for approved Graduates. Each semester may be elected independently.

15, 16. *Physical Chemistry*

Lectures and laboratory work. *Professor* BUCHER.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

17, 18. *Physical Chemistry, Advanced Course*

Lectures and laboratory work. *Professor* BUCHER.

Three hours. Through the year. Elective for approved Graduates who have passed Physics 1-6 and have taken or are taking Mathematics 6, 7, 8.

19. *Organic Chemistry, Advanced Course*
Professor Bucher.

Three hours. First semester. Elective for approved Graduates.

20. *Inorganic Chemistry, Advanced Course*
Professor Bucher.

Three hours. Second semester. Elective for approved Juniors, Seniors, and Graduates.

21, 22. *Organic Preparations, Advanced Course*
Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

23, 24. *Inorganic Preparations, Advanced Course*
Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates who have credit for 7, 8.

25, 26. *Research Work in Chemistry*
Professor Bucher.

Three hours or more. Through the year. Elective for Graduates.

27, 28. *Conference on Special Topics in Chemistry*
Professor Bucher.

One hour. Through the year. Elective for approved students.

29, 30. *Conference on Special Topics in Chemistry*
Professor Appleton.

One hour. Through the year. Elective for approved students.

31, 32. *Industrial Chemistry and Research*
Professor Appleton.

Three hours or more. Through the year. Elective for approved Graduates.

VII. CIVIL ENGINEERING‡

JOHN EDWARD HILL, C.E.M., Sc.D., *Professor of Civil Engineering*
ARTHUR HORACE BLANCHARD, C.E., A.M., *Associate Professor of Civil Engineering*
HENRY BERNARDIN DROWNE, C.E., *Instructor in Civil Engineering*

1, 2. *Surveying*

Theory and practice of plane surveying; use of tape, compass, level, and transit; adjustment of instruments; pen topography; contour drawing; conventional signs; plotting. *Professors* HILL *and* BLANCHARD, *Mr.* DROWNE.

Five hours and three hours. Through the year. Elective for students who have credit for Mathematics 18 and Mechanical Drawing 2. First semester, *Mon., Tu., Th., at 11.20, and Mon., Th., 2 to 5.* Second semester, *Mon. at 11.20, and Mon., Th., 2 to 5.*

4. *Surveying, Advanced Field Work*

Use of stadia, plane table, and barometer; precise base-line measurement with steel tape; triangulation; topography. Methods as in 1, 2. *Professors* HILL *and* BLANCHARD, *Mr.* DROWNE.

One hour. Spring recess. Elective for students who have credit for 1 and are taking 2.

6, 7, 8, 9. *Railroad Engineering*

Theory, location, construction, and economics of railroad engineering. Lectures, recitations, field work, and drafting. Second semester, railroad curves and practical problems. First semester, actual location of a line about two miles long, map, and estimate of cost. Second semester, railroad track and track work; maintenance of way department; economics of location. First semester, earthwork and its cost; rock excavation; tunneling. *Professor* HILL *and Mr.* DROWNE.

Two, three (six hours of field work), two, and two hours. Second, first, second, and first semesters. Courses 6 and 7 are elective for students who have credit for 2. Courses 8 and 9 are elective for Juniors and Seniors. Second semester, *Tu., Th., at 11.20;* First semester, *Wed., 9.20 to 5;* Second semester, *Tu.,Th., at 9.20;* First semester, *Fri. at 9.20, and Mon., 2.20 to 5.20.*

10. *Geodesy*

Problems in geodetic surveying, with sufficient theory for a proper

understanding of the formulas used. Lectures, recitations, and computations. *Professor* HILL.

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‡ All courses in this department are required for the degree of Bachelor of Science in Civil Engineering.

Two hours. One hour of recitation and two hours of computations. Second semester. Elective for students who have credit for 4, and Astronomy 5. *Tu., 2.20 to 4.20; Wed. at 9.20.*

12. *Highway Engineering*

Economics and location of country roads; surveys, grades, drainage, and foundations; construction and maintenance; economics and design of pavements; dust prevention and preservation of macadam roads; use of bituminous materials in the construction and maintenance of roads; methods of testing road materials; roads and pavements in foreign countries; systems of administration and maintenance; highway laws. Lectures, recitations, inspection trips, and seminary work. *Professor* BLANCHARD.

Three hours. Second semester. Elective for Sophomores, Juniors, and Seniors. *Mon., Tu., Th., at 8.*

13. *Hydraulic Engineering* ‡

Consideration of water supply mainly from a sanitary standpoint. A general course designed to give the chemical and biological aspects of water supply without laboratory work. Lectures, recitations, and seminary work. *Professor* HILL.

Two hours. First semester. Elective for Juniors and Seniors. *Mon., Th., at 10.20.*

15. *Framed Structures*

The standard forms of simple roof trusses; calculation by analytical methods of stresses due to dead, snow, and wind loads; calculation by analytical methods of stresses in Pratt, Howe, Warren, and parabolic trusses due to dead, wind, uniform live, excess panel live, road roller, and locomotive wheel loads; miscellaneous trusses, skew bridges, cranes, trussed bents, and towers; general discussion of continuous, cantilever suspension bridges and arched ribs, and continuous and non-continuous center-bearing swing bridges; deflection of framed structures; theorem of least work. Lectures on American and English shop practice; the aesthetic design of bridges; design of standpipes and elevated tanks; the American methods of erection of bridges and structures. Lectures, recitations, and seminary work. *Professor* BLANCHARD.

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‡ Courses 13, 30, and 32 cover the general subject of sanitation.

Three hours. First semester. Elective for students who have credit for Mechanics 2. *Mon., Tu., Th., at 8.*

17. *Elements of Structural Design*

Center of gravity and moment of inertia of combinations of structural shapes; riveted joints, tension members, compression members, combined direct and bending stresses, secondary stresses, columns under direct and eccentric loading; wooden structures; plate girder, pin-connected, and riveted Pratt truss bridges; construction of viaducts and elevated railroads; steel mill-building and high-building construction; comparison of standard structural specifications. Lectures, recitations, and computations. *Professor* BLANCHARD.

Two hours. First semester. Elective for students who have credit for Mechanics 2. *Tu., 9.20 to 11.20.*

19, 20. *Bridge and Roof Design and Graphic Statics*‡

Graphic determination of center of gravity of combinations of structural shapes, of moments in beams and stresses in simple roof trusses; determination of shears, moments, and stresses in plate girders and bridge trusses by the use of influence lines; complete design, with general drawings, of a roof truss; revision and discussion of checked drawings; design, with general drawings, of a plate girder highway bridge, and of a Pratt truss railroad bridge. Lectures, drawing, computations, inspection trips, and seminary work. *Mr.* DROWNE.

Three hours. One hour of recitation and four hours of drafting or six hours of drafting. Through the year. Elective for students who have credit for Mechanical Drawing 4, and have credit for or are taking 15 and 17. First semester, *Tu., 11.20 to 1.20, and 2.20 to 6.20.* Second semester, *Tu., 10.20 to 1.20, and 2.20 to 5.20.*

22. *Reinforced Concrete and Masonry Structures*‡

Theory and design of reinforced concrete beams, columns, retaining walls, dams, foundations, bridges, and culverts; systems of reinforcements; methods of construction. Stone masonry; static and elastic theory of the masonry arch ; theory and design of masonry piers, retaining walls, bridge abutments, and high masonry dams; complete design, with drawings, of a reinforced concrete highway bridge; a reinforced concrete retaining wall; a voussoir stone arch, abutments, and wing walls; and a high masonry dam. Lectures, recitations, drafting, and computations. *Professor* BLANCHARD *and Mr.* DROWNE.

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‡ Courses 19, 20 and 22 may not be elected separately.

Five hours. Two hours of recitation and six hours of drafting. Second semester. Elective for students who have credit for Mechanics 2 and Mechanical Drawing 4. *Mon. at 10.20 ; Th., 10.20 to 1.20, and 2.20 to 6.20.*

24. *Foundations*

Soundings and borings, foundation-beds, deposition of concrete under water, timber foundations, coffer-dams, open caissons, Cushing cylinder piers, pile formulae, driving and foundations, pneumatic caissons of wood and steel, open dredging, the Poetsch freezing process, foundations in quicksand, foundations for high buildings. Lectures, recitations, and seminary work. *Professor* BLANCHARD.

One hour. Second semester. Elective for students who have credit for Mechanics 2. *Mon. at 9.20.*

26. *Law of Contracts*

Essential elements of a contract; the parties to a contract, considerations, bids and bidders; work for private parties and public work. Employment of engineers, liability of the engineer as a professional man; when his functions are judicial; when he is a public officer. Engineering specifications and accompanying documents. Lectures and discussion of written decisions on typical cases assigned each week. *Professor* BLANCHARD.

One hour. Second semester. Required of all candidates for the degree of Bachelor of Science. *Th. at 9.20.*

28. *Engineering Jurisprudence*

Patents and patent laws including inventions, novelty, utility, abandonment, applications, letters patent, reissues, infringements, damages, injunctions, and profits; real property, water rights, ownership, rights of way, boundaries, incorporeal rights, and franchises. Lectures, recitations, and seminary work. *Professor* BLANCHARD.

One hour. Second semester. Elective for Juniors and Seniors. *Tu. at 9.20.*

30. *Hydraulic Engineering* ‡

Consideration of water supply mainly from an engineering standpoint. Irrigation, pumps, and pumping machinery; construction of dams and reservoirs. Lectures, recitations, and seminary work. Supplements Mechanics 4, which gives the theoretical treatment of the subject. *Professor* HILL.

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‡ Courses 13, 30, and 32 cover the general subject of sanitation.

Two hours. Second semester. Elective for students who have credit for Mechanics 3. *Wed., Fr., at 10.20.*

32. *Sanitary Engineering*‡

Theory of sewerage, treatment and disposal of sewage; stream pollution; house drainage and its appliances; garbage collection and disposal. Design of sanitary works. Lectures, recitations, drafting, and seminary work. *Professor* HILL.

Three hours. Second semester. Elective for students who have credit for Mechanics 3. *Wed., Fri., at 11.20, and Mon., 2.20 to 5.20.*

34. *Hydraulic Surveying* (*applied Hydraulics*)

Methods of surveying applicable to river and harbor work. Methods of measuring and rating the flow of streams. Actual measurement of the discharge of a stream by means of the current meter, weir, and floats. Recitations and field work. *Mr.* DROWNE.

One hour. One hour of recitation or eight hours of field work. Second semester. Elective for students who have credit for 2 and Mechanics 3. *Tu. at 8, and 9.20 to 5.20.*

35. *Thesis*

A thesis is required of all candidates for the Degree of Bachelor of Science in Civil Engineering. The thesis must embody either a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

VIII. ECONOMICS§

HENRY BRAYTON GARDNER,† PH.D., *Professor of Economics*
JAMES MARVIN MOTLEY, PH.D., *Associate Professor of Economics*
RALPH CAHOON WHITNACK, A.B., *Instructor in Economics*

1. *Elementary Economics*

Affords an outline and discussion of the fundamental principles of the subject. *Professor* MOTLEY.

Three hours. In connection with Social and Political Science 1 constitutes a year course required in Sophomore, Junior, or Senior year of candidates for the degree of Bachelor of Arts, and in Sophomore year of candidates for the degree of Bachelor of Science. Elective for others. Beginning with the class entering in 1911, required also of candidates for the degree of Bachelor of Philosophy. The combined courses will be given in two divisions. For the first division Economics will precede Social and Political Science; for the second, the order will be reversed. *1st div., first semester, Tu., Fri., Sat., at 10.20; 2d div., second semester, Mon., Wed., Fri., at 12.20.*

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‡ Courses 13, 30, and 32 cover the general subject of sanitation.

§ The courses in this department other than 1 are open only to those students who have credit for Economics 1, and Social and Political Science 1.

† On leave of absence during the academic year 1911–12.

3, 4. *General Economics*

Covers those portions of the subject not fully treated in Economics 1. Recommended for all students in the department. The development and significance of the characteristic features of modern economic life; the principles governing the exchange, distribution, and consumption of wealth; the more important practical economic problems. During the second semester special attention will be given to railway transportation and the problems incident to its administration and control. *Professor* MOTLEY *and Mr.* WHITNACK.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.20.*

5, 6. *Money and Banking*

Principles of money; recent monetary history, particularly of the United States; systems of the leading industrial nations; present problems. Principles of banking; recent banking history, particularly of the United States; systems of the leading industrial nations; present problems, with special reference to the problem of the reform of the banking system in the United States. *Mr.* WHITNACK.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

7. *Socialism and Labor Problems*

A brief review of the historically important socialistic schemes; an analysis and criticism of the leading socialistic theories, with special emphasis upon present day proposals; the rise of the trade union and the influence of collective bargaining; labor problems in the United States. *Professor* MOTLEY.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

10. *Tariff, Reciprocity, and Shipping Subsidies*

The development of the American system of protection and its effect upon domestic industry and international commerce; an analysis and criticism of arguments for protective tariff and for free trade; reciprocity agreements; policies of leading nations with regard to state aid to shipping. *Professor* MOTLEY.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

[11. *Public Finance*]

General principles of public finance; revenues and expenditures of leading industrial nations; public enterprises in their financial aspects; principal forms of taxation and their effects; public debts.

Three hours. First semester. Not offered in 1911–12. To be offered in 1912–13.

[12. *The Financial History of the United States*]

Covers the period from the adoption of the Constitution to the present day.

Three hours. Second semester. Not offered in 1911–12. To be offered in 1912–13.

[13. *Statistics*]

The principles of statistics as a method of recording and presenting social and economic facts; the possibilities and limitations of the statistical method; the interpretation of statistics; some of the important results of statistical investigation.

Three hours. First semester. Not offered in 1911–12. To be offered in 1912–13.

[14. *Accounting*]

The importance of accounting in economic life and the principles which underlie it; the accounting systems of public bodies and quasi-public corporations; the interpretation of financial statements.

Three hours. Second semester. Not offered in 1911–12. To be offered in 1912–13.

[15. *Trade and Transportation*]

The organization of international trade and the place of the United States in the commerce of the world; a description of the existing trade relations of the United States, of the conditions which control them, and the probable lines of their development. The organization and development of the internal trade of the United States with special reference to railway transportation and the problems to which it has given rise.

Three hours. First semester. Not offered in 1911–12. To be offered in 1912–13.

[16. *Corporations and Corporation Finance*]

The corporation as a form of business organization; its formation and promotion; capitalization; forms of securities; the stock market; state and federal control and similar topics.

Three hours. Second semester. Not offered in 1911–12. To be offered in 1912–13.

21, 22. *Investigation of Special Topics*

Intended to afford a training in methods of gathering, handling, and presenting data in the study of economic life and problems. Each student is assigned a separate topic. *Professor* MOTLEY *and Mr.* WHITNACK.

Three hours. Six hours of attendance. Through the year. Each semester may be elected independently. Students intending to take either of these courses must secure the permission of the head of the department not later than December 1 or June 1 in the semester preceding that in which they desire to take the course. It is expected that as a rule these courses will be taken in connection with lecture courses. Hours to be arranged with the instructor.

23, 24. *Economic Seminary*

Study of important aspects of economic theory, history, and current problems of economic life. The first semester, 1911–12, will probably be devoted to a study of questions connected with the economic history of the United States. *Professor* MOTLEY *and Mr.* WHITNACK.

Three hours. Two hours of attendance. Through the year. Elective for Seniors and Graduates who have taken advanced work in Economics. Hours to be arranged with the instructor.

IX. EDUCATION ‡

WALTER BALLOU JACOBS, A.M., *Professor of the Theory and Practice of Education*

————————————, *Assistant in Education*

1. *History of Education*

Education among the early culture peoples; development of education in Greece and Rome; early Christian education ; the Renaissance and humanism; the beginnings of modern education; the naturalistic movement — Rousseau ; the psychological movement — Pestalozzi, Froebel, Herbart; the scientific movement — Spencer and Huxley;

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‡ Courses 1 and 2 treat education in its relation to the individual and to the social and political whole; interest in them is therefore not limited to those who intend to teach. At the same time they form an introduction to the more advanced courses in Education. Those who intend to teach are advised to elect these courses during the Junior year.

Courses 1–4 cover the usual requirements for certificates of the First Grade except where practice teaching or experience is demanded. In Rhode Island a certificate is required of all teachers in schools supported in whole or in part by public money. Cerrecent sociological tendencies; the American college; industrial education.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates, and by permission. *Mon., Wed., Fri., at 12.20.*

2. *Principles of Education*

The meaning and aim of education; its function as a social institution; physical education—heredity, growth, and development; intellectual education—its aim, the choice of studies, their organization into a consistent whole; the principles of method in teaching; moral education. Education as limited by environment and as gaining the mastery over environment.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates, and by permission. *Mon., Wed., Fri., at 12.20.*

3. *The Process of Education; its Psychology and Hygiene*

Theory and process of mental and physical development with especial emphasis upon the period of adolescence. Educational psychology; mind as developing out of the control of instincts; the learning process; imitation and suggestion as factors in education; the psychology of the various studies and disciplines; the theory of formal discipline. The hygiene of body and mind; play and fatigue, physical culture and athletics; arrested growth in body and mind, its causes and its prevention.

Three hours. First semester. Elective for students who have credit for 1 or 2, or who are taking 1, and for Graduates. *Mon., Tu., Th., at 11.20.*

4. *Practical Introduction to Teaching*

The elements of method and their application in practice teaching; observation of good teaching; management and discipline of classes; administration of education; school buildings, their proper construction, maintenance, and equipment; medical inspection; school law.

Three hours. Second semester. Elective for students who have taken or are taking other courses in Education, and for Graduates. *Mon., Tu., Th., at 11.20.*

5. *Secondary Education; its Organization and Function*‡

The place of the high school and academy in the American system

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tificates of the First Grade are granted without examination to those who have completed courses 1-4 and hold a college degree. Due credit is also given for separate courses.

Certificates, authorizing the holders to teach in the evening schools of the state, are issued without examination to students who have completed three years of regular work, including Education 1-2.

‡ In connection with this course, and for an explanation of the work of student-teachers, see the Catalogue, page 179.

of education; comparison with secondary schools in Germany, France, and England; the administration of secondary education; its relation to the colleges and universities; meaning and value of the various secondary school studies, and their organization into a curriculum; high schools; the social life of the high school and academy; high school extension.

Three hours. Two hours of classroom attendance. First semester. Required of student-teachers. Elective for Graduates and experienced teachers, and for approved Seniors. *Wed., 3.20 to 5.20.*

6. *Secondary Education; Methods and Processes*‡

The principles of method as applied to teaching in secondary schools; the resources at the command of the teacher; the preparation of teachers. The following will receive especial attention as typical secondary school studies: English, Modern Languages and Latin, History, Science, and Mathematics; the Manual Arts.

Three hours. Two hours of classroom attendance. Second semester. Required of student-teachers. Elective for Graduates and experienced teachers, and for approved Seniors. *Wed., 3.20 to 5.20.*

7, 8. *Problems in Practical Teaching; Secondary Schools*‡

Practice teaching in the Providence High Schools. Observation, reports, and conferences. Designed for those who wish to become instructors in colleges, teachers or principals in secondary schools, or superintendents of schools.

Three hours. Through the year. Elective for Graduates who have credit for elementary courses in Education and who are taking 5 and 6; also for approved Seniors. *Fri. at 3.20*, and at other hours to be arranged.

9, 10. *Problems in Practical Teaching; Grammar Grades*‡

Practice teaching in the Providence Grammar Schools. Observation, reports, and conferences. Designed especially for those who wish to become grade teachers, principals of grammar schools, or superintendents of schools, but also for those who wish to teach in secondary schools. The following studies receive special attention: Arithmetic, Language, History, and Geography.

Three hours. Through the year. Elective for Graduates who have credit for elementary courses in Education and who are taking 11, 12; also for approved Seniors. *Mon. at 3.20*, and at other hours to be arranged.

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‡ In connection with this course, and for an explanation of the work of student-teachers, see the Catalogue, page 179.

11, 12. *Seminary in Education* ‡

Studies in current educational problems. The seminary will be conducted in two parts in successive hours. *Part A.* Reviews of the latest books upon education and related subjects, and studies of special topics assigned for presentation. *Part B.* A more intensive study of certain problems of current interest. For 1911–12 the subjects will be: First semester, Mental and Physical Measurements and their Importance in Education. Second semester, Administrative and Social Phases of Education. As subjects are not repeated, the course may be elected for successive years.

Three hours. Through the year. Two hours of classroom attendance. Required of student-teachers. Elective for Graduates and experienced teachers, and for approved Seniors. A or B may be elected independently as a one-hour course. *Sat., 10.20 to 12.20.*

X. ENGLISH §

WALTER COCHRANE BRONSON, A.M., LITT.D., *Professor of English Literature*

LINDSAY TODD DAMON, A.B., *Professor of English Literature and Rhetoric*

ALBERT KNIGHT POTTER, A.M., *Associate Professor of the English Language*

GEORGE WYLLYS BENEDICT, PH.D., *Associate Professor of English*

THOMAS CROSBY, A.M., *Associate Professor of English and Public Speaking*

HENRY BARRETT HUNTINGTON, A.B., *Associate Professor of English*

WILLIAM THOMSON HASTINGS, A.M., *Instructor in English*

STANLEY BATES HARKNESS, A.B., *Instructor in English*

LAURENCE RICH GROSE, A.M., *Instructor in English*

WALTER BROOKS HENDERSON, PH.B., *Assistant in English*

JOHN DONALD PRYOR, PH.B., *Assistant in English*

1, 2. *Rhetoric and Composition*

Designed to give the student a clear and correct style and some critical standards. Lectures and recitations upon the principles governing prose style; prescribed reading; themes. *Professors* Damon, Benedict, *and* Huntington, *Messrs.* Hastings, Harkness, Grose, Henderson, *and* Pryor.

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‡ In connection with this course, and for an explanation of the work of student-teachers, see the Catalogue, page 179.

§ Credit for English 1, 2 is a prerequisite for admission to all other courses in the department except 19, 20.

Courses 1-16 may not be counted in fulfillment of the requirement of a year in English Literature.

Three hours. Through the year. Required of all Freshmen. *1st, 2d, 3d, and 4th div., Mon., Tu., Th., at 11.20; 5th, 6th, 7th, and 8th div., Mon., Wed., Fri., at 12.20; 9th div., Wed., Fri., Sat., at 11.20; 10th div., Mon., Tu., Th., at 3.20.* Students repeating the course must enter division 9.

3, 4. *English Composition, Second Course*

Intended to supplement the training given in 1, 2, and to develop further the power of exact and lucid statement. Lectures, recitations, and prescribed reading; weekly themes and other written exercises involving a variety of specific tasks such as abstracts; reports; scientific, technical, and historical papers; criticism; stories; the personal essay; etc. *Professor* Benedict.

Three hours. Through the year. Elective for Sophomores. *Tu., Fri., Sat., at 10.20.*

5, 6. *English Composition, Advanced Course*

Intended to develop ease of style and clarity and vigor of thought. Frequent practice in composition and criticism. *Professor* Damon.

Three hours. Through the year. Elective for Juniors and Seniors and, with the permission of the instructor, for Sophomores who have attained the grade of C in 1, 2. With the consent of the instructor the course may be repeated. *Mon., Tu., Th., at 2.20.*

7, 8. *Argumentative Composition*

Intended to develop the power of handling argumentative topics cogently and persuasively. Lectures on the principles and forms of argumentative composition; frequent practice in brief-drawing and the writing of forensics and less formal arguments. *Professor* Huntington.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors; required in the Sophomore year of candidates for the degree of Bachelor of Philosophy who did not take mathematics in their Freshman year. *Tu., Fri., Sat., at 10.20.*

9. *Argumentative Composition*

Intended to furnish a more rapid training than 7, 8, for students who wish to begin debate as early as possible or to go quickly over the fundamentals of argumentative composition. The principles and forms of brief-drawing and forensic writing. Lectures, written exercises, briefs, and forensics. *Professor* HUNTINGTON.

Three hours. Two hours of attendance. First semester. Elective for Juniors and Seniors. Not elective for students who have taken 7, 8. *Mon. at 3.20; Fri. at 2.20.*

10. *Debate*

Intended to train students in correct and vigorous oral presentation of ideas. *Professor* HUNTINGTON, *with the coöperation of the Professors of Economics, Social and Political Science, History, and Public Speaking.*

Three hours. Second semester. Elective for a limited number of Juniors and Seniors who have credit for 9, or 7. With the consent of the instructor the course may be repeated. *Mon., 3.20 to 5.20; Fri., 2.20 to 4.20.*

11, 12. *Public Speaking*

Principles of voice culture; vocal interpretation of literature; extempore speaking. *Professor* CROSBY.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Wed., Fri., Sat., at 11.20.*

[13, 14. *Public Speaking, Advanced Course*]

Practice in reading lyric, narrative, and dramatic literature, in extempore speaking, and in the composition and delivery of the common forms of the occasional address. Special attention to securing right tone-production and to improvement in speech. *Professor* CROSBY.

Three hours. Through the year. Elective for students who have attained the grade of C in 11, 12. Not offered in 1911–12.

15, 16. *Old English*

Essentials of Anglo-Saxon grammar; prose selections; Beowulf. *Professor* POTTER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 4.20.*

17, 18. *Chaucer*

Primarily a study of the poems as literature, with sufficient attention to Middle English grammar to enable the student to read intelligently. Selections from Langland and Gower. *Professor* POTTER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 3.20.*

19, 20. *English Literature from the Beginning to 1892*

An outline course in the history of English literature, with reading and study of the greater writers. *Professor* Bronson.

Three hours. Through the year. Elective for Sophomores, and for Freshmen who are candidates for the degree of Bachelor of Philosophy. *Tu. Th., Sat., at 12.20.*

[21, 22. *History of the Drama in England*]

The drama as a literary type and its history in England to 1642. *Professor* Potter.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for a year's work in English Literature. Not offered in 1911–12.

23. *The Modern English Drama*

The history of the English drama from 1660 to the present time. Reading and discussion of the work of the chief playwrights from Wycherley and Congreve to Jones, Pinero, and Shaw. *Professor* Crosby.

Three hours. First semester. Elective for Juniors and Seniors who have credit for a year's work in English Literature. *Mon., Wed., Fri., at 12.20.*

25, 26. *Shakspere*

Careful study of a few plays with special attention to exact interpretation. In 1911–12 the plays read will be *Othello, Henry V, King Lear, Love's Labour's Lost, Antony and Cleopatra, Cymbeline. Mr.* Hastings.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Th., Sat., at 12.20.* Not to be offered in 1912–13.

27, 28. *Shakspere*

Brief survey of the drama before Shakspere. Shakspere as playwright and poet. Reading of all the plays; more careful analysis of selected masterpieces. Lectures; discussions and reports on assigned topics. *Professor* Potter.

Three hours. Through the year. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.20.*

[29, 30. *English Literature exclusive of the Drama, from 1600 to 1660*]

The decline of the Elizabethan spirit; Puritanism and Anglicanism in literature; the "metaphysical" and mystical poets; the cavalier lyrists; all the English poems and some of the prose works of Milton. *Professor* Bronson.

Three hours. Through the year. Elective for students who have credit for a year's work in English Literature. Not offered in 1911–12.

[31, 32. *English Literature from 1660 to 1798*]

The Restoration drama; the classical school; development of the essay and the novel; the beginnings of romanticism.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for a year's work in English Literature. Not offered in 1911–12.

33, 34. *The English Novel*

The history of the English novel from 1700 to 1900; reading and discussion of the greater English novelists, including Defoe, Richardson, Fielding, and Smollett in the eighteenth century, and Scott, Jane Austen, Dickens, Thackeray, Charlotte Brontë, George Eliot, Meredith, Hardy, and Stevenson in the nineteenth century. *Professor* Damon.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for Juniors and Seniors. *Mon., Tu., Th., at 11.20.* Not to be offered in 1912–13.

[35. *English Literature from 1798 to 1832, Poetry*]

The reaction from pseudo-classicism; the influence of the French Revolution; liberalism and individualism in English poetry; contemporary criticism. Wordsworth, Coleridge, Southey, Scott, Byron, Shelley, Keats, Landor.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. First semester. Elective for Sophomores, Juniors, and Seniors. Not offered in 1911–12.

[36. *English Literature from 1798 to 1832, Prose*]

The development of the romantic novel; the rise of the reviews and quarterlies; essays and miscellaneous prose. Scott, Jane Austen, Coleridge, Jeffrey, De Quincey, Lamb, Hazlitt.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Second semester. Elective for Sophomores, Juniors, and Seniors. Not offered in 1911–12.

37. *English Literature from 1832 to 1892, Prose*

Modifications of romanticism; realism; the influence of science and democracy; tendencies at the end of the century. Essays, history, the novel, miscellaneous prose. Macaulay, Carlyle, Arnold, Ruskin, Pater, Dickens, Thackeray, the Brontës, George Eliot, Newman, Huxley. *Professor* BENEDICT.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. First semester. Elective for Sophomores, Juniors, and Seniors. *Mon., Wed., Th., at 10.20.*

38. *English Literature from 1832 to 1892, Poetry*

Modifications of romanticism; Pre-Raphaelitism; the influence of science and democracy; tendencies at the end of the century. Tennyson, Browning, Arnold, Clough, Rossetti, Morris, Swinburne. *Professor* BENEDICT.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Second semester. Elective for Sophomores, Juniors, and Seniors. *Mon., Wed., Th., at 10.20.*

39, 40. *American Literature*

American literature from the beginning to 1900, in its relation to American life and to English literature. A rapid survey of the literature of the seventeenth and eighteenth centuries; reading and study of the writers of the nineteenth century, with special attention to Irving, Cooper, Bryant, Poe, Longfellow, Emerson, Hawthorne, Whittier, Lowell, Holmes, and Whitman. *Professor* BRONSON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for a year's work in English Literature. *Tu., Wed., Sat., at 9.20.* Not to be offered in 1912–13.

42. *Contemporary English and American Literature*

Aims to stimulate a taste for literature through the appeal of modern writers, and to study the tendencies of modern thought through the literature that reflects it. Reading and discussion of contemporary poets, novelists, and essayists. Carman, Dowson, Henley, Hovey, Moody, Noyes, Watson; Bennet, De Morgan, Hewlett, Howells, Locke, Mrs. Humphry Ward, Wells; Benson, Chesterton, Crothers, Dawson, Lang. *Professor* CROSBY.

Three hours. Second semester. Elective for Juniors and Seniors. *Mon., Wed., Fri., at 12.20.*

43, 44. *Seminary in English Literature*

Subject for 1911–12: The history of literary criticism in England, with practice in various kinds of criticism. *Professor* Bronson.

Three hours. Two hours of attendance. Through the year. Elective for Graduates, and for a limited number of Seniors who have attained the grade of C in two years' work in English Literature.

XI. GEOLOGY

Charles Wilson Brown, A.M., *Assistant Professor of Geology*
Nelson Clark Dale, A.M., *Instructor in Geology*
________________________, *Assistant in Geology*

1, 2. *General Geology*

First semester: Dynamic and Structural Geology. A discussion of earth origin and of agencies producing various topographic forms, rock-changes, deformation of crust, vulcanism, mountain building, and continent making. Second semester: Stratigraphy and Paleontology. An historical summary of earth-development, especially with reference to the North American Continent, including changes in areas of land and sea, vulcanism, mountain building, sedimentation, ancient life types, and the principles of organic evolution they illustrate. Lectures illustrated by stereopticon, maps, models, and specimens. Two field trips in the autumn and three in the spring.

Three hours. Through the year. Elective for Undergraduates. Course 2 may be taken in continuation of 1 or 5. *Mon., Wed., Th., at 10.20.*

3, 4. *General Geology*

A shorter course than 1, 2, with emphasis upon the discussion of problems that may arise in engineering work. Special attention in map and field study to topographic features resulting from the various geologic agencies, and to the study of hand specimens of ores, minerals, and rock types and their uses.

Two hours. Four hours of attendance. Required in the Junior year of candidates for the degree of Bachelor of Science in Civil Engineering. Not elective. First semester, *Mon. at 10.20, Fri. at 9.20;* second semester, *Mon., Wed., at 10.20.*

5. *Physical Geography*

Study of the origin, development, and recognition of topographic features produced by agencies such as rivers, oceans, glaciers, and vulcanism; discussion of soils, ores, and other natural resources. May be continued in 6 or 8.

Three hours. First semester. Elective for Undergraduates excepting Freshmen and Sophomores who are not taking another course in the department. *Mon., Th., at 10.20.* Conference hour to be arranged with the instructor.

6. *Economic Geography and Conservation*

A discussion of the laws of meteorology, and the relation of climate to soil products and to man and his development; the physiographic controls that influence the development of transportation and commerce; agriculture, forests, water power, and water supply; the location and proper development of cities, and the geographic distribution and conservation of ore deposits and other natural resources. May be continued in 8, or 11, 12.

Three hours. Second semester. Elective for Undergraduates who have credit for 1 or 5, or who presented physiography for admission, excepting Freshmen and Sophomores who are taking another course in the department. *Tu., Wed., Sat., at 9.20.*

[7. *Economic Geology*]

A discussion of the theories concerning the origin of ore deposits, geologic relations, and the location, distribution, and production of ores.

Three hours. First semester. Elective for Undergraduates who have credit for 1, 3, or 9, 10. Not offered in 1911–12.

8. *Stratigraphy and Structural Geology*

An introductory course in field geology. Study of areal and structural geology in igneous and sedimentary areas from geologic reports. Practice in the construction of geologic maps and work in the field areas.

Three hours. Second semester. One conference hour to be arranged, and the equivalent of five hours' work in the laboratory or field. Elective for Undergraduates who have credit for 1, 3, or 5.

9, 10. *Mineralogy and Petrography*

An introductory course in the macroscopic and microscopic study of minerals, ores, and rocks.

First semester, discussion of crystal forms and the laws of crystallography, determination by physical properties and blow-pipe analysis of the more common minerals and ores. Second semester, study of the optical properties of the rock-forming minerals, rocks, and ores, under the polarizing microscope; determination of rock types; discussion of the fundamental principles of the origin and classification of the rocks and ores.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Th., at 11.20.*

11, 12. *Research in Geology and Geography*

Advanced work in the library, laboratory, or field, in the various phases of geology or geography as outlined in the preceding elementary courses. Arranged to meet the requirements of individual students.

One to six hours. Through the year. Elective for Graduates and approved Undergraduates. Either semester may be elected independently.

XII. GERMANIC LANGUAGES AND LITERATURES‡

Camillo von Klenze, Ph.D., *Professor of the Germanic Languages and Literatures*

Asa Clinton Crowell, Ph.D., *Associate Professor of the Germanic Languages and Literatures*

John Henry Bachmann, A.M., *Instructor in German*

John Frederick Sievers, A.M., *Instructor in German*

Bernard Keenan, A.M., *Assistant in German*

1, 2. *Elementary Course, First Year*

Reading, grammar, composition, conversation, dictation, sight reading. *Professor* Crowell, *Messrs.* Bachmann *and* Sievers.

Three hours. Through the year. Required of all students who did not present German for admission. *1st div., Tu., Wed., Sat., at 9.20; 2d div., Mon., Th., Fri., at 9.20; 3d div., Tu., Th., Sat., at 12.20; 4th div., Mon., Tu., Th., at 2.20.*

3, 4. *Elementary Course, Second Year*

Reading of modern German stories of the type found in Baker's *German Stories,* lyrics (von Klenze or Hatfield), and two dramas illustrating respectively the classical and the modern period, for example, Schiller's *Maria Stuart* and Hebbel's *Agnes Bernauer.* Review of grammar; composition; conversation based upon the texts read. *Professor* CROWELL *and Mr.* KEENAN.

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‡ Students wishing recommendations from the department to teach German must pass a special examination designed to test their ability to write and to understand German, and, to some extent, to use the spoken language.

Three hours. Through the year. Elective for students who have credit for 1, 2. *1st div., Mon., Wed., Th., at 10.20; 2d div., Tu., Wed., Sat., at 9.20.*

5, 6. *Intermediate Course*

Reading of modern German stories of the type found in Baker's *German Stories,* lyrics (von Klenze or Hatfield), and one or two dramas of the classical period. Review of grammar; composition; conversation based upon the texts read. *Messrs.* BACHMANN *and* SIEVERS.

Three hours. Through the year. Required of all Freshmen who presented elementary German for admission. Not elective for students who have taken German in college. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Tu., Fri., Sat., at 10.20; 3d div., Mon., Wed., Th., at 10.20.*

7, 8. *Advanced Course in Standard Authors, Classical and Modern*

One drama of Goethe or Schiller, one drama of Grillparzer, one drama of Hebbel, von Klenze's *Deutsche Gedichte,* a modern novel like Sudermann's *Frau Sorge.* Talks in German on the history of German literature; oral and written reports in German. *Mr.* BACHMANN.

Three hours. Through the year. Elective for students who have credit for 3, 4; 5, 6; or 9, 10, or who presented advanced German for admission. *Mon., Tu., Th., at 11.20.*

9, 10. *Modern Prose*

Aims to train the student in reading, speaking, writing, and understanding modern German. Reading of texts selected from fiction, history, and science; for example, Liliencron, Keller, Freytag, Helmholtz, Nichols's *Modern German Prose,* Paszkowski's *Lesebuch zur Einführung in die Kenntnis Deutschlands und seines geistigen Lebens,* 4th ed., and a text (such as Mosher's *Willkommen in Deutschland*) to introduce the student to the actual language of modern daily life. Talks in German; oral and written reports in German; letter-writing, composition, and conversation. *Professor* VON KLENZE *and Mr.* SIEVERS.

Three hours. Through the year. Elective for students who have credit for 3, 4; 5, 6; or 7, 8, or who presented advanced German for admission. *Tu., Fri., Sat., at 10.20.*

[11, 12. *German Lyrical Poetry*]

Introduces the student to the various aspects of the inner life of the

German people as reflected in the lyrical poetry of the last two centuries. Lectures in German; oral and written reports in German.

Three hours. Through the year. Elective for students who have credit for 3, 4; 7, 8; 9, 10. Not offered in 1911–12.

[13, 14. *The German Short Story*]

The development of the short story into an art form. The study of the "Novelle" as represented by Kleist, Ludwig, Heyse, C. F. Meyer, Keller, and others, with frequent reference to the chief writers of the short story in France, England, and America. Lectures and reports in German and English. *Professor* VON KLENZE.

Three hours. Through the year. Elective for students who have credit for 3, 4; 7, 8; 9, 10. Not offered in 1911–12.

[15, 16. *The German Drama of the Nineteenth Century*]

Kleist, Grillparzer, Hebbel, Hauptmann, and Sudermann. A study of the development of the German drama from waning romanticism to realism, with frequent reference to the chief representatives of the modern drama in other countries.

Three hours. Through the year. Elective for students who have credit for 3, 4; 7, 8; 9, 10. Not offered in 1911–12.

[17, 18. *Lessing and Schiller*]

Aims to introduce the student to the dramatic theory and practice of German classicism. Reading of one or two of Lessing's dramatic works and of several of the representative dramas of Schiller, especially *Wallenstein*. Discussions of the dramatic principles of the Greek and the English drama and of their influence upon Lessing and Schiller, with references to the dramatic theories of the nineteenth century. Lectures and reports in German and English. *Professor* CROWELL.

Three hours. Through the year. Elective for students who have credit for 7, 8; 9, 10. Not offered in 1911–12.

21, 22. *Goethe's Faust: Parts* 1 *and* 2

Interpretation of the text; study of the Faust legend and of other English and German dramas which present the Faust problem. Lectures and reports in German and English. *Professor* CROWELL.

Three hours. Through the year. Elective for students who have credit for 7, 8; 9, 10. *Mon., Th., Fri., at 9.20.*

[23, 24. *Goethe: A Study of His Life and Works*]

Lectures in German; reports on assigned topics; extensive reading. *Professor* von Klenze.

Three hours. Through the year. Elective for students who have credit for 7, 8; 9, 10. Not offered in 1911–12.

25, 26. *Outline History of German Literature*

Aims to acquaint the student with the most important movements in the evolution of German literary life. Lectures in German; reports on assigned topics; extensive reading. *Professor* von Klenze.

Three hours. Through the year. Elective for students who have credit for 7, 8; 9, 10. *Tu., Th., Sat., at 12.20.*

[27, 28. *German Literature in the Nineteenth Century*]

A study of the literary life of Germany as an expression of German civilization in the nineteenth century. The literary output — Romantic School, Young Germany, Naturalism, Realism, Neo-Romanticism — will be studied, with frequent references to prominent literary personalities in other domains of intellectual life, such as David Friedrich Strauss, Mommsen, Nietzsche, Wagner, etc. *Professor* von Klenze.

Three hours. Through the year. Elective for students who have credit for 7, 8; 9, 10. Not offered in 1911–12.

[31. *Gothic*]

The Gothic language, with reading of extracts in Streitberg's *Gotisches Elementarbuch* or Braune's *Gotische Grammatik. Professor* Crowell.

Three hours. First semester. Elective for Graduates and approved Undergraduates. Not offered in 1911–12.

[32. *Old High German*]

Grammar and reading of selections in prose and verse. Some knowledge of Gothic expected. Braune's *Althochdeutsche Grammatik* and Braune's *Althochdeutsches Lesebuch. Professor* Crowell.

Three hours. Second semester. Elective for Graduates and approved Undergraduates. Not offered in 1911–12.

33. *Old Norse*

Holthausen's *Altisländisches Elementarbuch;* Wilken's *Prosaische Edda;* Hildebrand's *Aeltere Edda. Professor* Crowell.

Three hours. First semester. Elective for Graduates and approved Undergraduates. Students electing Old Norse should also take Germanic Mythology. *Mon., Tu., Th., at 3.20.*

34. *Germanic Mythology*

Primitive Germanic religion, customs, and ideas, in their relations to German literature. Discussions based on E. Mogk's *Germanische Mythologie. Professor* CROWELL.

Three hours. Second semester. Elective for Graduates and approved Undergraduates. *Mon., Tu., Th., at 3.20.*

35, 36. *Middle High German*

The language of the Middle High German period, including an introduction to Germanic philology. Michel's *Mittelhochdeutsches Elementarbuch; Das Nibelungenlied, Minnesangs Frühling, Walter von der Vogelweide.* Lectures in German. Outside reading. *Professor* VON KLENZE.

Three hours. Through the year. Elective for Graduates and approved Undergraduates. *Wed., Fri., Sat., at 11.20.*

41, 42. *Seminary in German Literature*

Aims to give training in modern methods of investigation and criticism. To be conducted in German. *Professor* VON KLENZE.

Three hours. Through the year. Elective for Graduates and approved Undergraduates.

XIII. GREEK LITERATURE AND HISTORY

JAMES IRVING MANATT, PH.D., LL.D., *Professor of Greek Literature and History*

FRANCIS GREENLEAF ALLINSON, PH.D., *David Benedict Professor of Classical Philology*

————————, *Assistant in Greek*

A, B. *Elementary Course*

Designed to cover as much as possible of the entrance requirements, and thus to enable a student to take 1 in the following year if he completes by private study before the opening of the first semester the requirement in Homer, and before the opening of the second semester the requirement in the *Anabasis. Mr.* ——

Three hours. Through the year. Elective for students who did not present elementary and advanced Greek for admission. *Tu., Th., Sat., at 12.20.*

1. *Homer and the Greek Anthology*

Six books of the *Odyssey* in the original, with a general survey of the entire poem. Selections from the Elegiac, Iambic, and Lyric Poets. *Professor* MANATT.

Three hours. First semester. Elective for students who presented elementary and advanced Greek for admission, or who have credit for A, B, and have done the additional work indicated above. *Tu., Th., Sat., at 12.20.*

2. *Lysias and Plato*

Lysias: *Orations* VII, XII, XXIII, with collateral reading of Xenophon's *Hellenica*, II. Plato: *Apology* and *Crito*, with selections from *Phaedo*, and collateral readings from the *Euthyphron*, Xenophon's *Memorabilia*, and the *Clouds* of Aristophanes. *Professor* ALLINSON.

Three hours. Second semester. Elective for students who have credit for 1. *Tu., Th., Sat., at 12.20.*

3. *Lucian and the Dramatic Poets*

Selections from Lucian. Lectures on the Greek drama. The *Prometheus* of Aeschylus, and *Oedipus Tyrannus* of Sophocles. *Professor* ALLINSON.

Three hours. First semester. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

4. *The Historians*

The eighth book of Herodotus, with collateral reading of Aeschylus' *Persians* and Plutarch's *Themistocles*. The seventh book of Thucydides, with collateral reading of Plutarch's *Pericles* and *Nicias*. *Professor* MANATT.

Three hours. Second semester. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

5. *Epic Poetry*

The *Iliad*, XVIII–XXIV, with general study of the poem as a whole. Hesiod: Selections from the *Theogony* and the *Works and Days*. Selected Homeric Hymns. *Professor* MANATT.

Three hours. First semester. Elective for Juniors and Seniors. Hours to be arranged with the instructor.

6. *The Drama*

Menander; Aeschylus' *Seven against Thebes;* Euripides' *Medea;* Aristophanes' *Frogs*. *Professor* ALLINSON.

Three hours. Second semester. Elective for Juniors and Seniors. Hours to be arranged with the instructor.

[7. *Lyric and Pastoral Poetry*]

Pindar: selected Olympian and Pythian Odes; Bacchylides, v, xvii, xviii; Theocritus: Twelve *Idylls*. *Professor* MANATT.

Three hours. First semester. Elective for Juniors and Seniors. Not offered in 1911–12.

[8. *Plato, Aristotle, and Aeschylus*]

Selections from the *Republic* of Plato. Aristotle: The *Constitution of Athens*. The *Agamemnon* of Aeschylus, with collateral reading of the rest of the *Oresteia*. *Professor* ALLINSON.

Three hours. Second semester. Elective for Juniors and Seniors. Not offered in 1911–12.

[9. *The Attic Orators*]

Select speeches of Isaeus, Aeschines, and Demosthenes. *Professor* MANATT.

Three hours. First semester. Elective for Juniors and Seniors. Not offered in 1911–12.

[10. *Lucian and Pausanias*]

Professor ALLINSON.

Three hours. First semester. Elective for Juniors and Seniors. Not offered in 1911–12.

12. *Greek Composition*

Professor ALLINSON.

One hour. Second semester.

13, 14. *Modern Greek*

Introduction to the language; readings from living Greek authors and Greek newspapers; conversation. *Professor* MANATT.

One hour. Through the year. Elective for Sophomores, Juniors, and Seniors.

15. *Greek Civilization*

The life of the Greeks from Homer to the second century after Christ, with an especial study of the political, social, and religious institutions of the classical period as illustrated by the literature, history, and monuments of art. Followed in the second semester by Latin 15, Roman Civilization. The two semesters together constitute the course in Classical Civilization. *Professor* ALLINSON.

Three hours. First semester. Required of all candidates for the degree of Bachelor of Philosophy. Elective for others. *1st div., Mon., Th., Fri., at 9.20; 2d div. Mon., Tu., Th., at 11.20.*

16, 17, 19. *Greek Seminary*

First semester, Hesiod and the Homeric Hymns. *Professor* MANATT. Second semester, Lucian and Pausanias. *Professor* ALLINSON.

Three hours. Two hours of attendance. Through the year. Elective for Graduates and approved Seniors.

XIV. HISTORY ‡

WILLIAM MACDONALD, PH.D., LL.D., *George L. Littlefield Professor of American History*

THEODORE FRELINGHUYSEN COLLIER, PH.D., *Associate Professor of History*

1, 2. *Medieval and Modern History of Europe*

A general survey of the history of western Europe from the time of the barbarian invasions to the present. A narrative text-book supplemented by lectures, frequent written tests, and written reports and abstracts on assigned reading and topics for special investigation. *Professor* MACDONALD.

Three hours. Through the year. Required of candidates for the degree of Bachelor of Arts in either the Sophomore or the Junior year, and for candidates for the degree of Bachelor of Philosophy in either the Freshman, Sophomore, or Junior year. *Mon., Tu., Th., at 2.20.*

3. *Period of the Renaissance*

The breaking-down of the medieval social system and the rise and consolidation of national monarchies; the classical revival and the emancipation of learning; secularization and corruption of the church; social unrest and revolutionary outbreaks; geographical discoveries and economic changes. *Professor* COLLIER.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. Introductory to and a prerequisite for 4. *Tu., Th., Sat., at 12.20.*

‡ The elective courses in History are regularly open only to those who have credit for 1; but, by special permission of the instructor, elective courses may be taken by Juniors who are at the same time taking 1.

4. *Period of the Reformation*

Protestant revolt under Luther and Calvin; the Church of England; Hapsburg imperialism and the balance of power; the Counter-Reformation and religious wars; the Thirty Years' war; the Puritan revolution and the revolution of 1689 in England; Louis XIV and seventeenth century absolutism. *Professor* Collier.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates who have credit for 3. *Tu., Th., Sat., at 12.20.*

5. *The French Revolution and the Napoleonic Era*

A brief survey of the political development of western Europe from 1715 to 1789, followed by a more detailed study of the conditions in France on the eve of the Revolution, the course of the Revolution itself, and the rise and overthrow of Napoleon. *Professor* Collier.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.20.*

6. *Europe since 1815*

Reconstruction of Europe after the fall of Napoleon; the system of Metternich; revolutions of 1830 and 1848; the second French empire; the unification of Italy; the founding of the German Empire; the third French republic; formation of the dual monarchy of Austro-Hungary; Russia and the Eastern question; the dual and triple alliance, etc. *Professor* Collier.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. Should preferably be preceded by 5. *Tu., Fri., Sat., at 10.20.*

7, 8. *English Constitutional and Political History to 1714*

Formation and early development of the English constitution; the Hundred Years' war and the decline of feudalism; the Tudor dynasty; the Reformation in England; sea power, commerce, colonization; the Puritan revolution and revolution of 1689; beginnings of party government and the cabinet system. *Professor* Collier.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each semester may be elected independently, but 8 should preferably be preceded by 7. *Mon., Tu., Th., at 2.20.*

[9, 10. *English Constitutional and Political History since 1714*]

The internal political and constitutional development of England under the Hanoverians; the expansion of England into a colonial world empire; the party politics and international relations of the nineteenth century. *Professor* COLLIER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each semester may be elected independently, but 10 should preferably be preceded by 9. Not offered in 1911–12. To be offered in 1912–13.

11, 12. *Seminary in European History*

Detailed study of a limited period or of a special phase of social or political development, with a view to training in historical investigation and the use of sources. *Professor* COLLIER.

Three hours. One to two hours of attendance. Through the year. Elective for Graduates and approved Seniors.

13, 14. *American History*

A general course, covering the whole period from the beginnings of English colonization to the present time. Intended as an introduction to the advanced courses in American history and for students who wish only a general survey of the subject. *Professor* MACDONALD.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Each semester may be elected independently, but 12 should preferably be preceded by 11. *Wed., Fri., Sat., at 11.20.*

15, 16. *Constitutional and Political History of the United States*

An advanced course covering the period from 1783 to the present time. Intended primarily for students who wish to specialize in American history or who expect to study law. *Professor* MACDONALD.

Three hours. Two hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., at 12.20.*

17, 18. *Seminary in American History*

Designed to afford training in historical investigation and practice in the use of sources. The subjects vary from year to year, and are drawn from both the colonial and the constitutional periods. For 1911–12 the subjects are: First semester, The Relations between the American Colonies and England, 1689–1740. Second semester, The Administrations of Monroe, 1817–1825. *Professor* MACDONALD.

Three hours. One to two hours of attendance. Through the year. Elective for Graduates and approved Seniors. The course should be preceded by 13, 14, or 15, 16, but in exceptional cases may be taken by students who at the same time are taking 13, 14, or 15, 16.

19. *Principles of Historical Criticism and Research*

The general principles of historical criticism and the literature of historical theory. *Professor* MacDonald.

One hour. One semester. Elective for Graduates of one year's standing. Required of all candidates for the degree of Doctor of Philosophy in History.

XV. INDO-EUROPEAN PHILOLOGY

Francis Greenleaf Allinson, Ph.D., *David Benedict Professor of Classical Philology*

2. *General Introduction to the Study of Language*

Outline of the history of language; the Indo-European family. Adapted for students of ancient or modern languages.

Three hours. Second semester. Elective for Freshmen and Sophomores.

4. *Seminary in Comparative Philology*

For advanced students in Greek and Latin.

Three hours. One two-hour session weekly. Second semester. Elective for Graduates and approved Seniors.

5, 6. *Sanskrit, Elementary Course*

Whitney's *Grammar;* Lanman's *Reader;* selections from the *Vedic Hymns.*

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

[7, 8. *Sanskrit, Advanced Course*]

Vedic Hymns, and other selections.

One hour. Through the year. Elective for students who have credit for 5, 6. Not offered in 1911–12.

XVI. MATHEMATICS‡

Nathaniel French Davis, A.M., LL.D., *Professor of Pure Mathematics*

Henry Parker Manning, Ph.D., *Associate Professor of Pure Mathematics*

Roland George Dwight Richardson, Ph.D., *Assistant Professor of Pure Mathematics*

Clinton Harvey Currier, A.M., *Instructor in Mathematics*

Raymond Clare Archibald, Ph.D., *Instructor in Mathematics*

1 a. *Solid and Spherical Geometry*

Professors Davis *and* Manning *and Mr.* Currier.

Three hours. First semester. Required of candidates for the degree of Bachelor of Arts who presented only Algebra and Plane Geometry for admission. *One division, Tu., Fri., Sat., at 8; one division, Mon., Th., Fri., at 9.20; one division, Tu., Wed., Sat., at 9.20.*

2 a. *Trigonometry*

Professor Manning *and Mr.* Currier.

Three hours. Second semester. Required of candidates for the degree of Bachelor of Arts who presented only Algebra and Plane Geometry for admission. *One division, Tu., Fri., Sat., at 8; one division, Mon., Th., Fri., at 9.20; one division, Tu., Wed., Sat., at 9.20.*

1 b. *Solid and Spherical Geometry*

Professor Manning *and Mr.* Currier.

Three hours. First semester. For candidates for the degree of Bachelor of Philosophy who presented only Algebra and Plane Geometry for admission. Required of those who do not elect to take Argumentation in the Sophomore year. Elective for others. *One division, Mon., Th., Fri., at 9.20; one division, Tu., Wed., Sat., at 9.20.*

2 b. *Trigonometry*

Professor Richardson *and Mr.* Currier.

Three hours. Second semester. For candidates for the degree of Bachelor of Philosophy who presented only Algebra and Plane Geometry for admission.

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‡ The Undergraduate courses should be taken in the order 1, 2 (or 3, 4), 5, 6, 7, 8, 9, 10. Courses 3, 4 and 14 should be taken as opportunity offers in connection with the other courses. Courses 9 a, 17, 18, 19, 20 are for candidates for the degree of Bachelor of Science.

Courses 21–30 are designed for Graduates. Two or three of these courses are offered each year according to the needs of students. For those who have taken all of them, other courses can usually be arranged. These courses (and 14) may not be given unless elected by three students.

Required of those who do not elect to take Argumentation in the Sophomore year. Elective for others. *One division, Mon., Th., Fri., at 9.20; one division, Tu., Wed., Sat., at 9.20.*

3, 4. *Algebra*

Designed for those who wish to specialize in mathematics, and for those who are planning to teach mathematics in the secondary schools. *Professor* MANNING.

Three hours. Through the year. Required of candidates for the degree of Bachelor of Arts who presented Solid Geometry and Plane Trigonometry for admission and do not take Mathematics 5, 6. Also required of candidates for the degree of Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission and do not take Mathematics 5, 6, and do not elect to take Argumentation in the Sophomore year. Elective for others. *Mon., Th., Fri., at 9.20.*

5. *Plane Analytic Geometry*

Professor DAVIS.

Three hours. First semester. Required of candidates for the degree of Bachelor of Arts who presented Solid Geometry and Plane Trigonometry for admission and do not take 3, 4. Also required of candidates for the degree of Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission and do not take 3, 4, and do not elect to take Argumentation in the Sophomore year. Elective for students who have credit for 1, 2. *Tu., Wed., Sat., at 9.20.*

6. *Differential Calculus*

Professor DAVIS.

Three hours. Second semester. Required of candidates for the degree of Bachelor of Arts who presented Solid Geometry and Plane Trigonometry for admission and do not take 3, 4. Also required of candidates for the degree of Bachelor of Philosophy who presented Solid Geometry and Plane Trigonometry for admission and do not take 3, 4, and do not elect to take Argumentation in the Sophomore year. Elective for students who have credit for 5. Course 14 may be substituted for 6. *Tu., Wed., Sat., at 9.20.*

7, 8. *Differential and Integral Calculus*

A continuation of 6. *Mr.* CURRIER.

Three hours. Through the year. Elective for students who have credit for 6. Students are recommended to take 14 before taking 8 or at the same time with it. *Tu., Th., Sat., at 12.20.*

9, 10. *Differential Equations*

Professor MANNING.

Three hours. Through the year. Elective for students who have credit for 6 or 20. *Tu., Th., Sat., at 12.20.*

9 a. *Differential Equations*

Professor MANNING.

Two hours. First semester. Required of candidates for the degree of Bachelor of Science in Electrical Engineering. *Tu., Th., at 12.20.*

14. *Solid Analytic Geometry*

Dr. ARCHIBALD.

Three hours. Second semester. Elective for students who have credit for 5. May be taken in place of 6 as a required subject. *Tu., Th., Sat., at 12.20.*

15, 16. *Spherical Trigonometry*

Professor RICHARDSON *and Dr.* ARCHIBALD.

One hour. Through the year. Elective for students who have presented Plane Trigonometry for admission, and for those who have credit for 2, and have not taken Spherical Trigonometry in college. *Mon. at 9.20.*

17, 18. *Engineering Mathematics*

Advanced Algebra. Plane and Spherical Trigonometry, Analytic Geometry. *Professors* DAVIS *and* RICHARDSON, *Dr.* ARCHIBALD, *and Mr.* CURRIER.

Six hours. Through the year. Required of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., at 11.20.*

19, 20. *Differential and Integral Calculus*

Professors DAVIS *and* RICHARDSON, *Dr.* ARCHIBALD

Four hours. Through the year. Required of candidates for the degree of Bachelor of Science. *Two divisions, Tu., Wed., Sat., at 9.20, Fri. at 8; one division, Tu., Fri., Sat., at 10.20, Wed. at 8.*

21, 22. *Function Theory of a Complex Variable*

Professor MANNING.

Three hours. Through the year. Elective for Graduates and approved Seniors.

[23, 24. *Differential Equations, Advanced Course*]

Professor MANNING.

Three hours. Through the year. Elective for Graduates who have credit for 21, 22. Not offered in 1911–12.

25, 26. *Advanced Algebra*

Professor Richardson.

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors.

27, 28. *Differential Geometry*

Dr. Archibald.

Three hours. Through the year. Elective for Graduates and approved Seniors.

[29, 30. *Function Theory of a Real Variable*]

Professor Richardson.

Three hours. Through the year. Elective by special permission of instructor. Not offered in 1911–12.

XVII. MECHANICAL ENGINEERING‡

William Herbert Kenerson, M.E., A.M., *Associate Professor of Mechanical Engineering*

Thurston Mason Phetteplace, M.E., A.M., *Assistant Professor of Mechanical Engineering*

Henry Dewees Cady, *Instructor in Shop Practice*

James Alexander Hall, A.B., B.S., *Assistant in Mechanical Engineering*

1. *Wood-work*

Exercises in carpentry and wood-turning. Assigned reading and written reports. *Mr.* Cady.

Two hours. Five hours of attendance. First semester, *Tu., 2 to 5; Fri., 2 to 4.*

2. *Wood-work*

Exercises in pattern-making. Assigned reading and written reports. *Mr.* Cady.

Two hours. Five hours of attendance. Second semester, *Mon., Th., 2 to 4; Wed. at 11.20.*

3, 4. *Metal-work*

Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. Assigned reading and written reports. *Mr.* Cady.

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‡ All the courses in this department except 6 and 7 are required of candidates for the degree of Bachelor of Science in Mechanical Engineering, and with the exception of 1, 2, 3, 4, are elective for other students.

Two hours. Five hours of attendance. Through the year. First semester, *Mon. at 10.20; Tu., Fri., 2 to 4.* Second semester, *Wed., 2 to 4; Fri., 2 to 5.*

5. *Metal-work*

Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. Assigned reading and written reports. *Mr.* Cady.

Three hours. Seven hours of attendance. First semester, *Tu., Fri., 2 to 5; Fri. at 9.20.*

6. *Wood-work*

Exercises in carpentry, wood-turning and pattern-making. *Mr.* Cady.

Three hours. Seven hours of attendance. Elective for Sophomores, Juniors, and Seniors, who have had instruction in drawing. First semester, *Tu., Fri., 2 to 5.* Second semester, *Mon., Th., 2 to 5.*

7. *Metal-work*

Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. *Mr.* Cady.

Three hours. Seven hours of attendance. Elective for Sophomores, Juniors, and Seniors, who have had instruction in drawing. First semester, *Tu., Fri., 2 to 5.* Second semester, *Mon., Th., 2 to 5.*

8. *Kinematics*

Velocity ratios, rolling surfaces, cams, and belting. Recitations, drawing, and the solution of problems. *Professor* Phetteplace.

Three hours. Seven hours of attendance. Second semester. Elective for students who have credit for Mechanical Drawing 5. *Tu., 11.20 to 12.20; 2.20 to 5.20; Fri., 2.20 to 5.20.*

9, 10. *Kinematics*

Gearing, linkwork, parallel motions, and gear trains; machine tools; the application of the principles involved. Recitations, drawing, and the solution of problems. *Professor* Phetteplace.

Three hours. Seven hours of attendance. Through the year. Elective for students who have credit for 8 and for Mechanical Drawing 5. *Mon., 2.20 to 5.20; Wed. at 10.20; Th., 2.20 to 5.20.*

11, 12. *Machine Design*

Applications of the principles of mechanics and the strength of materials to the design of representative types of boilers, engines, and various mechanisms; solution of problems illustrating the method of designing bolts and nuts, keys, journals and bearings, fly-wheels, valve gears, etc. Lectures, calculation, and drawing. *Professor* PHETTEPLACE.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 9, 10, and Mechanics 2. *Mon., Th., 10.20 to 1.20.*

14. *General Engineering and Design*

Lectures; discussion of special engineering problems, patents and patent law, and cost systems. *Professors* KENERSON *and* PHETTEPLACE.

Three hours. Second semester. *Tu., Fri., 10.20 to 12.20.*

15, 16. *Thermodynamics*

Applications of the principles of gases and vapors to steam, gas, and other heat engines, air-compressors, refrigerating apparatus, etc.; discussion of the energy of fuel and the utilization of such energy for power purposes by means of various media; laws of the relation of variations of pressure, temperature, and volume of such media; analysis of the various cycles used in heat engines; the principles of the injector and the ejector. *Professor* KENERSON *and Mr.* HALL.

Three hours. Through the year. Elective for students who have credit for Physics 1, 2. *Tu., Wed., Sat., at 9.20.*

17, 18. *Engineering Practice*

Applications of the principles of thermodynamics and mechanics to the production, transmission, utilization, and measurement of power; valves and valve gears, and valve setting; indicator practice and tests of various forms of steam engines, gas engines, etc.; standardization of auxiliary apparatus used in making the various tests; boiler testing; flue gas and fuel analysis, etc. Lectures, recitations, and laboratory work. *Professor* KENERSON *and Mr.* HALL.

Three hours. Through the year. Elective for students who have credit for or are taking 15, 16. First semester, *Wed. at 8; Th., 2.20 to 4.20; Sat. at 10.20.* Second semester, *Wed., Fri., at 11.20; Sat. at 10.20; Th., 2.20 to 4.20.*

19, 20. *Materials of Engineering*

Study of the sources, manufacture, and properties of the important materials used in engineering; laboratory tests to determine the behavior of materials when subjected to tensile, compressive, and torsional stresses; mixing and testing of cements and mortars; preparation and examination of sections for the microscopical study of the structure of metals and alloys. Lectures, recitations, and laboratory work. *Professor* KENERSON *and Mr.* HALL.

Three hours. Through the year. Elective for students who have credit for or are taking Mechanics 1. *Tu., Fri., at 10.20. 1st div., Mon., 2.20 to 4.20; 2d div., Tu., 2.20 to 4.20; 3d div., Th., 2.20 to 4.20; 4th div., Mon., 9.20 to 11.20.*

21. *Power Plant Engineering*

Discussion of the relation and coördination of the various parts of the complete power plant; management, and methods of determining efficiency; selection of the best equipment from manufacturers' catalogues and actual inspection. Lectures, recitations, tests, and tours of inspection. *Professor* PHETTEPLACE.

Three hours. First semester. Elective for students who have credit for 15, 16. *Tu., Fri., 2.20 to 5.20; Wed., Sat., at 9.20.*

22. *Advanced Laboratory Course*

Investigation of special problems in hydraulic and steam engineering. Determination of experimental constants for the Venturi meter, flow of water over weirs and through pipes, flow of air, steam, etc. Particular emphasis laid on preparation and form of reports. *Professor* KENERSON *and Mr.* HALL.

Three hours. Second semester. *Tu., Fri., 2 to 5.*

24. *Applied Hydraulics.*

Laboratory experiments in connection with Mechanics 4. *Professor* KENERSON.

One hour. Second semester. Must be taken in connection with Mechanics 4 and Civil Engineering 34.

25, 26. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Mechanical Engineering. The thesis must embody a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XVIII. MECHANICS AND MECHANICAL DRAWING

OTIS EVERETT RANDALL, PH.D., *Professor of Mechanics and Mechanical Drawing*

ANSEL BROOKS, PH.B., M.E., *Associate Professor of Mechanics and Mechanical Drawing*

JOHN JOSEPH LONG, PH.B., *Instructor in Mechanical Drawing*

MECHANICS

1, 2. *Mechanics of Solids*

Statics, including resolution and composition of forces, determination of center of gravity, and problems relative to rigid bodies and flexible cords; dynamics, including rectilinear and curvilinear motion, virtual velocity, moment of inertia, work, energy and power, and friction; strength of materials, including tension, compression, shearing, torsion, and flexure; methods of graphical solution of problems. *Professors* RANDALL *and* BROOKS.

Four hours. Through the year. Elective for students who have credit for or are taking Mathematics 7, 8. Required of all candidates for the degree of Bachelor of Science. *Mon., Tu., at 11.20; Th., 10.20 to 12.20.*

3. *Mechanics of Fluids*

Hydrostatics; nature and use of instruments; flow through orifices, over weirs, through tubes, through pipes, in conduits, flow of rivers, water supply and water power. *Professors* RANDALL *and* BROOKS.

Three hours. First semester. Required of all candidates for the degree of Bachelor of Science. Elective for students who have credit for 1, 2. *Wed., Fri., Sat., at 11.20.*

4. *Applied Hydraulics*

Dynamics of water; theoretical consideration of water wheels, pumps, and pumping machinery. *Professors* RANDALL *and* BROOKS.

One hour. Second semester. Required of all candidates for the degree of Bachelor of Science. Elective for students who have credit for 3. To be taken in connection with Civil Engineering 30, and Mechanical Engineering 24. *Wed. at 11.20.*

5, 6. *Mathematical Mechanics*

Comprehensive treatment of the principles of statics and dynamics; strength of materials; higher theoretical and practical problems. Intended primarily for students who are interested in the application of the principles of pure mathematics. *Professor* RANDALL.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for or are taking Mathematics 7, 8.

MECHANICAL DRAWING

1, 2. *Elementary Mechanical Drawing*

Nature, care, and use of drafting instruments; lettering; plane problem construction; curve tracing; elementary projection. *Professor* BROOKS *and Mr.* LONG.

Two hours. Four hours of drawing. Through the year. Required in the Freshman year of candidates for the degree of Bachelor of Science. Elective in any year for other students. *Tu., Fri., 2.20 to 4.20; Wed., 2 to 6.*

3, 4. *Descriptive Geometry*

Discussion, proof, and graphic solution of problems relating to the point, line, and plane, line and surface generation and classification, surface tangency, intersections and developments; application of the principles of descriptive geometry in isometric drawing, shades and shadows and perspective, machine drawing, and practical engineering problems. *Professors* RANDALL *and* BROOKS, *Mr.* LONG.

Three hours. Two hours of recitation and three hours of drawing. Through the year. Required in the Sophomore year of candidates for the degree of Bachelor of Science. Elective for students who have credit for 1, 2. *Mon., Tu., Th., Fri., Sat., at 9.20; Tu., Sat., at 10.20.*

5. *Machine Drawing*

Study and representation of machine parts; the principles of elementary machine design; sketches, detail and assembly drawings of machines; practice in reading drawings. *Professor* BROOKS *and Mr.* LONG.

Three hours. One hour of recitation and eight hours of drawing. First semester. Required of candidates for the degree of Bachelor of Science in Mechanical Engineering or Electrical Engineering. Elective for students who have credit for 1, 2. *Tu. at 12.20; Mon., Th., 2.20 to 5.20.*

XIX. MUSIC

Hamilton Crawford Macdougall, Mus.D., *Lecturer in Music*

1. *The Symphony*

The development of the symphony from its earliest forms to the present day. Designed to give a familiarity with modern music, its history and appreciation. Assigned readings, oral tests, and written reports.

Three hours. First semester. Elective for Sophomores, Juniors, and Seniors. No previous knowledge of music required. *Mon., Th., at 10.20*, and a third hour at the pleasure of the instructor.

2. *Elementary Harmony*

A course in elementary composition. Frequent oral tests and daily written exercises in the construction and use of chords and the harmonization of melodies.

Three hours. Second semester. Elective for Sophomores, Juniors, and Seniors. No previous knowledge of music required. *Mon., Th., at 10.20*, and a third hour at the pleasure of the instructor.

XX. PHILOSOPHY

William Herbert Perry Faunce, A.M., D.D., LL.D., *Professor of Moral and Intellectual Philosophy*

Edmund Burke Delabarre, Ph.D., *Professor of Psychology*

Walter Goodnow Everett, Ph.D., *Professor of Philosophy and Natural Theology*

Alexander Meiklejohn, Ph.D., *Professor of Logic and Metaphysics*

————————————, *Instructor in Philosophy*

1, 2. *Logic*

A study of the aims, concepts, problems, methods, and results of thinking; a preparation for work in the sciences and in philosophy. The main topics are the logic of deduction, the definition of truth, and the relations of science, philosophy, and religion. *Professor* Meiklejohn.

Three hours. Through the year. Elective for Sophomores and Juniors. *Mon., Th., Fri., at 9.20.*

3, 4. *Psychology and Ethics*

First semester: Psychology. A survey of the main facts and laws of mental life, aiming to provide a sound foundation for further acquaintance with this and allied subjects, for an improved judgment in dealing with many practical problems, and for understanding the psychological bases of philosophy. Second semester: Ethics. An introductory course dealing in a concrete way with the moral values of daily experience, and intended to aid the student in forming a practical philosophy of life. First semester, *Professor* DELABARRE. Second semester, *Professor* EVERETT.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Either semester may be elected independently by Seniors only. In 1911–12, Juniors and Seniors who desire a full year's introductory course in Psychology may continue 3 through the second semester. *Tu., Wed., Sat., at 9.20.*

5, 6. *Psychology, Intermediate Course*

A study of the fundamental principles on which a scientific system of psychology must be based. The nature and composition of consciousness, its relation to bodily processes, and its complete subjection to law. The criteria for accepting evidence and forming sound judgments in connection with the problems of so-called "psychical research." In 1911–12 this course will be conducted as a seminary. *Professor* DELABARRE.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for a course in Psychology.

7, 8. *History of Philosophy*

The successive philosophical systems as revealing the logical development of European philosophy. The treatment also aims to exhibit the significant relations which philosophy has sustained to civilization, especially in its fundamental, political, scientific, religious, and cultural elements. *Professor* EVERETT.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

9. *Philosophy of Religion*

A study of the nature of the religious consciousness, and of the ultimate problems of religious psychology and belief. *Professor* EVERETT.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates who have credit for a year course in Philosophy. *Tu., Wed., Sat., at 9.20.*

11, 12. *Experimental Psychology, Introductory Laboratory Course*

Description of the main lines and results of experimental research;

demonstrations by the instructor or the class; training in the use of apparatus and in careful scientific observation and measurement. *Professor* Delabarre.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3. Although essentially a year course, it may, by special arrangement with the instructor, be taken for a shorter period.

13, 14. *Problems of Modern Philosophy*

A seminary course designed to give acquaintance with current philosophical problems and discussions. *Professor* Meiklejohn.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for a year course in Philosophy.

[15, 16. *Kantian and Post-Kantian Philosophy*]

Kant's *Critique of Pure Reason* studied as a source of modern philosophical theories. *Professor* Meiklejohn.

Three hours. Through the year. Elective for Seniors who have credit for 7, 8, and for Graduates. Not offered in 1911–12.

[17, 18. *Psychology, Advanced Course*]

A seminary for the discussion of important problems in psychology. The course may be extended over several years if desired. The problems discussed will vary from year to year. *Professor* Delabarre.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3. Not offered in 1911–12. See 5, 6.

19, 20. *Experimental Psychology, Advanced Laboratory Course*

The aim is to study further the problems of experimental psychology, and, whenever possible, to make original contributions to scientific knowledge. The problems investigated vary and the course may be taken two or more years in succession. *Professor* Delabarre.

One to six hours. Two to twelve hours of attendance. Through the year. Elective for students who have credit for 11, 12. May be taken for more than six hours by Graduates.

[20, 21. *Advanced Ethics*]

A seminary course for the study of the more important problems of ethical theory. Lectures, written reports, and discussions. *Professor* Everett.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for a year course in philosophy. Not offered in 1911–12.

23, 24. *Philosophical Seminary*

A seminary for the study of the problems of historical and contemporary thought. Reading, written reports, and discussions. Subject for 1911–12: Historical and critical study of Christian ethics. *Professor* EVERETT.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for a year course in philosophy.

XXI. PHYSICS

CARL BARUS, PH.D., LL.D., *Hazard Professor of Physics*
ALBERT DEFOREST PALMER, PH.D., *Associate Professor of Physics*
ARTHUR EUGENE WATSON, PH.D., *Assistant Professor of Physics*
ROBERT FRANKLIN FIELD, A.M., *Instructor in Physics*

1, 2. *Elementary Physics* ‡

First semester, dynamics, molecular physics, and heat. Second semester, optics, acoustics, and electricity. The more elementary features of the subjects discussed. Lectures illustrated by experiments and the lantern; weekly written exercises. Designed for those who have had little previous training in physics. *Professor* BARUS.

Three hours. Through the year. Required of all candidates for the degree of Bachelor of Science. Elective for Undergraduates who have credit for entrance algebra and plane geometry. *Mon., Wed., Th., at 10.20.*

3, 4. *Elementary Physics, continued* ‡ §

Treats the more advanced parts of the subjects taken in the same order as in the preceding course. *Professor* BARUS.

Three hours. Through the year. Elective for students who have credit for 1, 2, and Mathematics 1, 2. *Tu., Fri., Sat., at 10.20.*

5, 6. *Experimental Physics* ‡

An introduction to the theory and practice of physical manipulation. Experimental study of physical phenomena selected to meet the needs of individual students. Written reports and solution of problems. *Professor* PALMER.

Three hours. Six hours in the laboratory. Through the year. Elective for students who have credit for 1, 2, or 3, 4.

‡ Students who intend to teach physics should elect courses 1, 2; 3, 4; 5, 6.

§ Graduates taking course 3, 4 are held responsible for all the demonstrations, or for the full equivalent of either Watson's or Daniel's *Principles of General Physics*.

7, 8. *Mathematical Treatment of Dynamical Problems* ‡

Lectures. First semester, discussion of the general principles of dynamics and the development of the general equations of motion. Second semester, application of these principles to special problems in thermodynamics and hydrodynamics. *Professor* PALMER.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 5, 6, and Mathematics 9.

9, 10. *Mathematical Theory of Electricity and Magnetism* ‡

Lectures. Includes a discussion of the more important problems of electrical science. *Professor* PALMER.

Three hours. Through the year. Elective for Graduates and Seniors who have credit for 5, 6, and Mathematics 9.

11, 12. *Advanced Laboratory Course*

Special problems and reference to original sources for methods of solution. *Professors* BARUS, PALMER, *and* WATSON.

Three or six hours. Six or twelve hours of attendance. Through the year. Elective for students who have credit for 5, 6.

13, 14. *Applied Harmonic Analysis and Applied Vector Analysis* §

Importance of Fourier's method shown by examples drawn from the analytical theory of heat, from elastics, alternating electricity, and elsewhere; treatment by the aid of spherical harmonics. Bessel functions, and Lamé functions; the chief theorems of vector analysis produced and applied to dynamics, elastics, hydrodynamics, the electromagnetics of Maxwell and Hertz, and the electronic theory of Heaviside, Lorentz, and others. *Professor* BARUS.

Three hours. Through the year. Second semester. Required of candidates for the degree of Bachelor of Science in Electrical Engineering. Elective for Seniors and Graduates who have credit for 1, 2, and Mathematics 7, 8.

15, 16. *Physics, Advanced Course* §

Lectures on dynamics, potential, elastics, hydrostatics, hydrodynamics, viscosity, capillarity, electrostatics, magnetism, electro-magnetism, thermo-electrics, induction, Fresnel's optics, the electromagnetic theory of light, thermal analytics, and thermodynamics. *Professor* BARUS.

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‡ In determining which of the two courses 7, 8, and 9, 10, shall be offered in any given year, the preference of students will be considered.

§ In determining the content of courses 13, 14, and 15, 16, the preference of students will be considered.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for Mathematics 7, 8.

21, 22. *Theory of Measurements*

Lectures and recitations on the theory and precision of measurements, and on methods of taking, recording, and reducing observations; laboratory instruction in selected physical measurements. *Professor* PALMER *and Mr.* FIELD.

Three hours. Five hours of attendance. Through the year. Required of all candidates for the degree of Bachelor of Science. Elective for students who have credit for 1, 2, and Mathematics 7 or 20. *1st div., Mon., Tu., at 12.20; 2d div., Mon., Th., at 12.20.* Laboratory hours will be posted in 11 Wilson Hall on the first day of each term.

23, 24. *Precision Measurements in Photometry, Electricity, and Magnetism*

Professor PALMER.

Four hours. Eight hours in the laboratory. Through the year. Elective for students who have credit for 5, 6 or 21, 22, and Mathematics 7.

25, 26. *Radiation, Optics, and Heat.*

Experimental study of selected phenomena, demonstrations, and personal conferences. *Professor* PALMER.

Three or six hours. Six or twelve hours in the laboratory. Through the year. Elective for students who have credit for 5, 6 or 21, 22.

ELECTRICAL ENGINEERING‡

Professor WATSON *and Mr.* FIELD

1, 2. *General Course*

Methods of generating and utilizing electric currents; theory and working of dynamo-electric machinery.

Three hours. Two hours of recitation or lecture and two hours in the laboratory. Elective for students who have credit for or are taking Physics 5, 6 or 21, 22, and Mathematics 6 or 19. First semester, *Mon., Th., at 9.20.* Second semester, *Mon., Fri., at 9.20.* Laboratory assignments for afternoons.

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‡ All the courses in this department are required of candidates for the degree of Bachelor of Science in Electrical Engineering. Courses 1 and 2 are required of candidates for the degree of Bachelor of Science in Mechanical Engineering. Course 1 is required of candidates for the degree of Bachelor of Science in Civil Engineering.

3, 4. *Alternating Currents*

Mathematical and graphical treatment.

Three hours. Two hours of recitation or lecture and two hours in the laboratory. Through the year. Elective for students who have credit for 2, and who have taken or are taking Mathematics 9. *Tu., Fri., at 10.20.* Laboratory assignments for afternoons.

6. *Calculation and Design of Direct Current Electrical Machinery*

Three hours. Second semester. Must be taken with 2. Not elective. *Tu., Wed., Th., at 9.20.*

7. *Telegraph and Telephone Engineering*

Three hours. First semester. Elective for students who have credit for 2. *Mon., Wed., Th., at 10.20.*

8. *Alternating Current Machinery*

Calculation and design of generators, motors, transformers, etc.

Three hours. Second semester. Must be taken with 10. Elective for students who have credit for 1, 2, and 3. *Mon., Th., Fri., at 9.20.*

10. *Power and Lighting Stations*

Equipment and systems of distribution.

Three hours. Second semester. Must be taken with 8. Elective for students who have credit for 1, 2, and 3. *Mon., Wed., Th., at 10.20.* Weekly trips of inspection.

12. *Specific Electrical Engineering Problems*

Reading and discussion. Seminary method.

One hour. Second semester. Not elective. *Mon. at 11.20.*

13, 14. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Electrical Engineering. The thesis must embody a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XXII. ROMAN LITERATURE AND HISTORY

ALBERT GRANGER HARKNESS, A.M., LITT.D., *Professor of Roman Literature and History*

JOHN FRANCIS GREENE, A.M., *Assistant Professor of Roman Literature and History*

1. *Livy*

Designed to enable the student to acquire facility in reading Latin, and to instruct him in the use of the Latin texts as a means of gaining a knowledge of Roman history; grammatical study and literary criticism also receive attention. *Professors* HARKNESS *and* GREENE.

Three hours. First semester. Elective for students who presented elementary and advanced Latin for admission. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Tu., Th., Sat., at 12.20.*

2. *Cicero's Letters*

Aims and methods as in 1. *Professors* HARKNESS *and* GREENE.

Three hours. Second semester. Elective for students who presented elementary and advanced Latin for admission. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Tu., Th., Sat., at 12.20.*

3. *Horace's Odes and Epodes, Tibullus, Propertius*

Critical study of the poems, supplemented by rapid reading with a view to comprehending the spirit of the author; the literary side of the study is made prominent. Lectures; literary topics assigned to the class for special study. *Professor* GREENE.

Three hours. First semester. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

4. *Horace's Satires, Juvenal*

Aims and methods as in 4. *Professor* HARKNESS.

Three hours. Second semester. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

[5, 6. *Latin Poetry*]

Aims to give a connected and comprehensive view of the history and development of Latin poetry. Forms with 7, 8 a two-year consecutive course affording a general survey of Roman literature. Lectures on the lives and writings of the authors; reading of characteristic selections; special study by members of the class of assigned topics in literary history and criticism. First semester, Plautus. Second semester, Lucretius and Catullus. *Professors* HARKNESS *and* GREENE.

Three hours. Through the year. Elective for Juniors and Seniors. Each semester may be elected independently. Not offered in 1911–12.

7, 8. *Latin Prose*

Aims to give a connected and comprehensive view of the history and development of Latin prose. Forms with 5, 6 a two-year consecutive course affording a general survey of Roman literature. Lectures on the lives and writings of the authors, on the development of oratory, etc.; reading of characteristic selections; special study by members of the class of assigned topics in literary history and criticism. First semester, specimens of early Latin, Cicero's *Brutus*, and Quintilian. Second semester, the *Annals* of Tacitus. *Professors* HARKNESS *and* GREENE.

Three hours. Through the year. Elective for Juniors and Seniors. Each semester may be elected independently. *Tu., Wed., Sat., at 9.20.*

9, 10. *Petronius, Pliny the Younger, Martial*

Professor HARKNESS.

One hour. Through the year. Elective for Juniors, Seniors, and Graduates. *Fri. at 2.20.*

11, 12. *Latin Composition*

Professor GREENE.

One hour. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon. at 3.20.*

13, 14. *History of the Roman Empire*

The Early Empire. The Age of the Antonines. The Age of Constantine. *Professor* GREENE.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Each semester may be elected independently.

17, 18. *Seminary in Latin*

Subject for 1911–12: Reading from the poetry of the Empire. Gudeman's *Latin Literature of the Empire*, vol. II. Questions in textual criticism and in the structure of Latin verse will be considered. *Professors* HARKNESS *and* GREENE.

Three hours. Two hours of attendance. Through the year. Elective for Graduates.

15. *Roman Civilization*

An outline of Roman civilization and its influence on modern times. Special attention will be given to the literature and to the political and social life. Preceded in the first semester by Greek 15, Greek Civilization. The two semesters together constitute the course in Classical Civilization. No knowledge of Latin required. *Professors* HARKNESS *and* GREENE.

Three hours. Through the year. Required in Freshman or Sophomore year of candidates for the degree of Bachelor of Philosophy. Elective for others. *1st div., Mon., Th., Fri., at 9.20 ; 2d div., Mon., Tu., Th., at 11.20.*

XXIII. ROMANCE LANGUAGES AND LITERATURES

COURTNEY LANGDON, A.B., *Professor of the Romance Languages and Literatures*

ALBERT BUSHNELL JOHNSON, A.M., *Associate Professor of the Romance Languages*

CHARLES HERMAN HUNKINS, DR. *de l'Université de Paris, Instructor in French*

GILBERT CHINARD, B. ès L., L. ès L., *Instructor in French*

1, 2. *Elementary Course. First Year*

Grammar, composition, dictation, conversation; translation of selections from modern authors into idiomatic English. *Dr.* HUNKINS *and Mr.* CHINARD.

Three hours. Through the year. Required of students who did not present French for admission. *1st div., Tu., Th., Sat., at 8 ; 2d div., Tu., Wed., Sat., at 9.20 ; 3d div., Mon., Tu., Th., at 2.20.*

[3, 4. *Elementary Course. Second Year*]

Reading of easy modern French prose in the form of stories, plays, or historical or biographical sketches; review of grammar; composition and conversation based upon the texts read.

Three hours. Through the year. Elective for students who have credit for 1, 2. Not offered in 1911–12.

5, 6. *Intermediate Course*

Reading of modern and classical authors; review of grammar; composition and conversation based upon the texts read; dictation. *Professor* LANGDON, *Dr.* HUNKINS, *and Mr.* CHINARD.

Three hours. Through the year. Required of students who presented elementary French for admission. Elective for students who have credit for 1, 2. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Tu., Th., Fri., at 8; 3d div., Mon., Th., Fri., at 9.20.*

7, 8. *Advanced Course*

An introduction to classical and modern French literature; composition; conversation based on the texts read; dictation. *Professor* JOHNSON *and Dr.* HUNKINS.

Three hours. Through the year. Elective for students who presented advanced French for admission, or who have credit for 5, 6. *Mon., Tu., Th., at 11.20.*

9, 10. *The Realistic School*

Flaubert, Augier, the younger Dumas, the Goncourts, Daudet, Zola, Taine, Loti, and others; abstracts, in French, of works read outside the class; sight reading a prominent feature. *Professor* JOHNSON.

Three hours. Through the year. Elective for students who have credit for 7, 8. *Mon., Th., Fri., at 9.20.*

11, 12. *The Romantic School*

The history of the romantic school; reading of authors from Chateaubriand and Victor Hugo to Rostand; abstracts on outside reading. Lectures in English and in French. *Professor* LANGDON.

Three hours. Through the year. Elective for students who have credit for 7, 8. *Wed., Fri., Sat., at 11.20.*

13, 14. *The Classical School*

The history of the classical school; its formation, its apogee, and its decline. Lectures in French. *Mr.* CHINARD.

Three hours. Through the year. Elective for students who have credit for 9, 10, or 11, 12, and for approved students who have credit for 7, 8. *Mon., Tu., Th., at 11.20.*

15, 16. *Modern Spanish*

Grammar, conversation, composition, and reading of modern authors. *Professor* JOHNSON.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern language. *Tu., Fri., Sat., at 10.20.*

[17, 18. *Modern Italian*]

Grammar, composition, and reading of modern authors. *Professor* LANGDON.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern language. Not offered in 1911–12.

19, 20. *Dante in English*

A study of the whole of the *Divina Commedia* in English, in the light of modern thought and of other world-poems. *Professor* LANGDON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Students are advised to elect this course in their Senior year. *Mon., Tu., Th., at 11.20.*

XXIV. SOCIAL AND POLITICAL SCIENCE ‡

JAMES QUAYLE DEALEY, PH.D., *Professor of Social and Political Science*

LESTER FRANK WARD, A.M., LL.D., *Professor of Sociology*

JOHN CORLISS DUNNING, LL.B., PH.D., *Instructor in Social and Political Science*

SOCIAL SCIENCE

1. *Social and Political Science, Elementary*

Affords a general outline of these subjects, and serves as an introduction to the more extended and special courses which follow. *Professor* DEALEY.

Three hours. In connection with Economics 1 constitutes a year course required in Sophomore, Junior, or Senior year of candidates for the degree of Bachelor of Arts, and in Sophomore year of candidates for the degree of Bachelor of Science. Elective for others. Beginning with the class entering in 1911, required also of candidates for the degree of Bachelor of Philosophy. The combined courses will be given in two divisions. For the first division Economics will precede Social and Political Science; for the second, the order will be reversed. *1st div., second semester, Tu., Fri., Sat., at 10.20; 2d div., first semester, Mon., Wed., Fri., at 12.20.*

3, 4. *Social Problems and Conditions*

First semester, development of modern social institutions and problems involved. Racial questions of western civilization. A study of emigration and immigration. Second semester, modern social problems, such as charity, crime, intemperance, marriage and divorce. Social legislation. Constructive social movements. *Professor* DEALEY *and Dr.* DUNNING.

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‡ The courses in this department other than 1 are open only to those students who have credit for Social and Political Science 1 and Economics 1.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

5, 6. *Ancient Society and its Institutions* ‡

First semester, formation and dispersion of primitive groups; origin of races; union and coalescence of groups; the race struggle; institutions growing out of the race struggle; stages of culture. Second semester, domestic relations; kinship groups; marriage and the family; institutions growing out of domestic relations; gentile society; transition to political society; primary institutions. *Professor* WARD.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

7. *Sociology as a Science* ‡

Its relations to other sciences; its psychologic basis; its fundamental principles and their sources in the less complex sciences. *Professor* WARD.

Three hours. First semester. Elective for Seniors and Graduates. Followed by 8. *Wed., Fri., Sat., at 11.20.*

8. *Application of Sociological Principles* ‡

The utility of sociology as a means of increasing human achievement. The improvement of society through conscious effort. Scientific legislation. *Professor* WARD.

Three hours. Second semester. Elective for Seniors and Graduates. Preceded by either 5, 6, or 7. *Wed., Fri., Sat., at 11.20.*

9, 10. *Sociological Aspects of Education*

First semester, the sociological theory of education. The social importance of intellectual development and of the diffusion of knowledge. Second semester, the sociological curriculum. Survey of the several fields of knowledge in the order of nature. *Professor* WARD.

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‡ Course 5, 6 deals with the subject chiefly from the historical standpoint. Course 7 deals mainly with the principles and theory of sociology. Undergraduates should not elect both of these courses in the same year, and 5, 6 should precede 7. Course 8 may properly follow either of these.

Three hours. Through the year. Elective for Seniors and Graduates. *Tu., Fri., 4.30 to 6.*

11, 12. *Sociological Theories*

First semester, ancient and medieval theories in respect to social conditions and development. Precursors of sociology. Second semester, sociological theories since the opening of the nineteenth century. A review of modern sociological thought in Europe and America and its influence on the life and institutions of society. This course includes courses 9 and 10 of former years. *Professor* DEALEY.

Three hours. Through the year. Offered if applied for by Graduates.

13, 14. *Investigation of Special Topics*

Intended to train the student in methods of gathering, handling, and presenting data in the study of social problems. For the year 1911–12 the subject will be Municipal Conditions and Social Welfare, including a study of social statistics. Laboratory methods. This course is the same as course 20, 21, 22 of former years. *Professor* DEALEY.

Three hours. Six hours of attendance. Through the year. Elective for Graduates, and for a limited number of approved Juniors and Seniors. Each semester may be elected independently.

POLITICAL SCIENCE

1. *Political and Social Science, Elementary*

See Social Science 1.

3, 4. *Government and Politics of the United States*

First semester, American political theories. The nature of the federal union. Organization, powers, and methods of the national government. Current national political issues. Second semester, state and municipal government and politics. Organization, administration, and functions of the cities and commonwealths of the United States. This course is substantially the same as courses 3, 4 of former years. *Professor* DEALEY *and Dr.* DUNNING.

Three hours. Through the year. Elective for Juniors and Seniors. *Mon., Th., Fri., at 9.20.*

5. *Governments and Politics of Foreign States*

The political systems of typical leading states, including some of the states of Latin-America. Current international political situations and problems. This course is substantially the same as course 5 of former years. *Dr.* Dunning.

Three hours. First semester. Followed in the second semester by 6. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

6. *International Relations*

International law, diplomacy, current questions involving international relations. This course takes the place of course 2 of former years. *Dr.* Dunning.

Three hours. Second semester. Preceded in the first semester by 5. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

7. *Jurisprudence*

The development of law and of its fundamental principles. Influence of Roman law on modern political institutions. This course is practically the same as courses 6, 7 of former years. *Dr.* Dunning.

Three hours. First semester. Followed in the second semester by 8. Elective for Seniors and Graduates. *Tu., Wed., Sat., at 9.20.*

8. *Constitutional Law*

Principles and development of constitutional law, with special reference to the Constitution of the United States. This course is substantially the same as course 8 of former years. *Dr.* Dunning.

Three hours. Second semester. Preceded in the first semester by 7. Elective for Seniors and Graduates. *Tu., Wed., Sat., at 9.20.*

9. *Development of Political Theories*

Classical and medieval political theories. Development of modern democratic theories in England, France, and the United States. This course is substantially the same as course 14 of former years. *Dr.* Dunning.

Three hours. First semester. Followed in the second semester by 10. Offered if applied for by Graduates.

10. *Modern Theory of the State*

The origin and development of the state, its sovereignty, its governmental organization and functions. Theories underlying the organization of political parties. This course is substantially the same as course 13 of former years. *Dr.* Dunning.

Three hours. Second semester. Preceded in the first semester by 9. Offered if applied for by Graduates.

11, 12. *Current Social and Political Theory and Practice*

A seminary course. Intended to train students in methods of estimating the value and significance of recent publications on social and political topics. Study of current problems arising through changing social conditions. During the year 1911–12, special attention will be given to publications in German and French. This course takes the place of Political Science 15 and Social Science 7 of former years. *Dr.* DUNNING.

One hour. Through the year. Elective for Graduates and approved Seniors. *Mon. at 5.*

13, 14. *Investigation of Special Topics*

Intended to train students in methods of gathering and presenting data in the study of political problems. In connection with this course, work in comparative legislation may be taken under the direction of the Legislative Reference Bureau of the State Library. Laboratory methods. This course is the same as course 20, 21, 22 of former years. *Professor* DEALEY.

Three hours. Six hours of attendance. Through the year. Elective for Graduates, and for a limited number of approved Juniors and Seniors.

PHYSICAL TRAINING

FREDERICK WILLIAM MARVEL, PH.B., *Professor of Physical Training*

From the close of the Thanksgiving recess to the Spring recess, all first and second year students are required to attend gymnasium exercises three times a week as follows:

FRESHMEN. *1st div., Tu., Fri., Sat., at 10.20 ; 2d div., Mon., Tu., Th., at 4.20.*

SOPHOMORES. *1st div., Mon., Wed., Th., at 10.20; 2d div., Tu., Th., Fri., at 3.20.*

A voluntary class for Juniors and Seniors will be held on *Mon., Tu., Th., Fri., at 5.10.* Classes in heavy gymnastics, under the direction of a special instructor, are held four afternoons a week. Classes in wrestling, under the direction of a special instructor, are held two afternoons a week. Instruction in swimming, under the direction of a special instructor, is given by appointment.

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VOL. IX JUNE, 1912 NO. 3

BULLETIN
OF
BROWN UNIVERSITY

ANNOUNCEMENT OF COURSES
1912-1913

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UNIVERSITY OF ILLINOIS.

WOMEN'S COLLEGE EDITION

PROVIDENCE
PUBLISHED BY THE UNIVERSITY
[APRIL, MAY, JUNE, OCTOBER, DECEMBER]

second-class matter *April* 1, 1905, *at the Post Office at Providence, R. I., under Act of Congress of July* 16, 1894

ANNOUNCEMENT OF COURSES
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THE WOMEN'S COLLEGE
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PROVIDENCE, RHODE ISLAND
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1912

GENERAL ANNOUNCEMENTS
FOR
THE ACADEMIC YEAR
1912–13

THE Academic Year begins with chapel service in Pembroke Hall, at 9 a.m., on Wednesday, September 25.

For information regarding Registration and Enrolment of Undergraduates and Graduates, and Requirements for the various Degrees, see pages 6–19 of this Announcement. The following special announcements relate to the Women's College. Undergraduates must register at the Registrar's Office, in Pembroke Hall, between 9 a.m. and 12 m., or between 2 p.m. and 4 p.m., on September 23 and 24. Undergraduates in residence must return their Registration cards to the Register not later than June 8. Graduate students register at the office of the Registrar of the University.

COURSES OF INSTRUCTION

WITH the exception of Biology 1 and 51, 52, Greek Literature and History 20, and Roman Literature and History 3, courses of instruction are identical with corresponding courses offered to men. Detailed information may be found on pages 19–86. The officers of instruction are those conducting courses for men also, with the addition of:

LIDA SHAW KING, A.M., *Professor of Classical Literature and Archaeology*

ALICE WILSON WILCOX, A.M., *Instructor in Biology*

*Courses designated by a † are given at the University; women are admitted to them, but only on the recommendation of the Dean of the Women's College. Women may also be admitted to other University courses not announced here, with the special permission of the department and with the consent of the Dean of the Women's College. In courses designated by a * a final mark covering the work of the course as a whole is given at the end of the course, the marks given at the end of the first semester being regarded as temporary. Graduate courses are not included in this list, although ap-*

proved Seniors are admitted to many of them. For Graduate courses, see pages 19–86.

ART

1, 2. *History of Art from Antiquity through the Renaissance*

Professor POLAND.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. *Tu., Wed., Sat., at 9.25.*

[3, 4. *Modern Art, and Theory and Criticism of the Fine Arts*]

Not offered in 1912–13.

15,* 16.* *Freehand Drawing*

Training of hand and eye by study in charcoal and pencil of casts and still-life objects.

One hour. Two hours of drawing. Through the year. Elective for Undergraduates. Given at the Rhode Island School of Design. Hours to be arranged with the Director.

17,* 18.* *Advanced Drawing and Color Work*

Practical work in light and shade, and in color.

Three hours. Six hours of drawing, or four hours of drawing and one hour lecture on Historic Ornament. Through the year. Elective for students who have credit for 15, 16, and who have taken or are taking 1, 2. Given at the Rhode Island School of Design. *Mon., Tu., Wed., at 2.* Lecture hour to be arranged by the Rhode Island School of Design.

19,* 20.* *Architectural Design*

Principles of architectural design and composition taught by means of lectures, problems in design, and working drawings.

Three hours. One hour of recitation and four hours of drawing. Through the year. Elective for students who have credit for Mechanical Drawing 3, 4. Given at the Rhode Island School of Design. *Mon. at 3.* Drawing hours to be arranged with the Director.

ASTRONOMY

1, 2. *General Course*

Professor UPTON.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for Mathematics 1, 2. *Wed., Fri., Sat., at 11.25.* Observations at Ladd Observatory.

7, 8.† *Advanced Astronomy*

Designed for students who wish to specialize in Astronomy.

Three hours. Through the year. Elective for approved students who have credit for 1, 2. Not given unless elected by four or more students.

BIBLICAL LITERATURE AND HISTORY

1, 2.† *Elementary Hebrew*

Dr. STERN.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

[11, 12.† *Gospels and Epistles*]

Not offered in 1912–13.

13, 14.† *Acts and Pauline Epistles*

Professor FOWLER. [This year *Professor* CROSS.]

15, 16. *Old Testament Literature and History*

Professor FOWLER. [This year *Professor* CROSS.]

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. *Tu., Wed., Sat., at 9.25.*

[17, 18. *New Testament Literature and History*]

Not offered in 1912–13.

[19, 20. *The English Bible as Literature*]

Not offered in 1912–13.

21, 22.*† *Biblical Seminary*

Professor FOWLER. [This year *Professor* CROSS.]

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors who have taken courses in Biblical Literature and History or in Social Science.

BIOLOGY

1, 2. *General Biology*

The structure of animals and plants; elementary vital phenomena;

the functions of organs; the development of organisms; classification. An outline of the more important biological theories, such as evolution, natural selection, variation, mutation and heredity, and the principles upon which modern hygiene and sanitation are based. The course will introduce the student to the use of the microscope, laboratory technic, and to scientific methods of observation and experiment. *Miss* WILCOX.

Three hours. Six hours of attendance. Through the year. Required in Freshman or Sophomore year of candidates for the degree of Bachelor of Philosophy beginning with the class entering in 1911. Elective for Undergraduates. Lectures, *Tu.*, *Sat.*, *at 9.25*. Laboratory sections: Freshmen, *Mon.*, *10.25 to 12.15;* Sophomores, *Wed.*, *9.25 to 11.15;* Freshmen and Sophomores, *Fri.*, *2.25 to 4.15*.

3, 4.† *Comparative Anatomy of Vertebrates*

Professor WALTER.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1, 2. *Mon.*, *Wed.*, *Fri.*, *at 8*.

5, 6.† *Anatomy of the Nervous System*

Professor MEAD.

7, 8.† *Embryology and Histology*

Professor MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2. *Tu.*, *Th.*, *Sat.*, *at 8*.

9, 10.† *Advanced Histology and Pathology*

Professor MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 1, 2, and 7, 8.

11, 12.† *General Physiology*

Professor MITCHELL.

Three hours. Six hours of attendance. Through the year. Must be preceded by 1, 2, and by Chemistry 1, 2. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon.*, *Tu.*, *Th.*, *at 3.20*.

13, 14.† *Chemical Physiology*

Professor MITCHELL.

Three hours. Six hours of attendance. Through the year. Must be preceded by Chemistry 1, 2, and 15. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Tu., Fri., Sat., at 10.20.*

16.† *Bacteriology*

Professor Gorham.

Three hours. Six hours of attendance. Second semester. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon., Wed., Th., at 10.20.*

17, 18.† *Advanced Bacteriology*

Professor Gorham.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 16.

19.† *Invertebrate Zoölogy*

Professors Gorham *and* Walter.

One hour. Two hours of attendance. First semester. Elective for Undergraduates. *Wed., at 2.20.*

20. *Ornithology*

Professor Walter.

One hour. Two hours of attendance. Second semester. Elective for Undergraduates.

24.† *Physiology*

Professor Mitchell.

Three hours. Second semester. Elective for Juniors and Seniors. *Tu., Th., Sat., at 8.*

51, 52. *Applied Biology*

Aim: To show the contact of Biology with every-day life. Relation of micro-organisms to health, food, sanitation; embryological development; physiology of adolescence; heredity. *Miss* Wilcox.

Three hours. Through the year. Elective for undergraduates. Two lectures, demonstrations and discussion. *Mon., Wed., Fri., at 12.25.*

BOTANY

1, 2. *General Course*

Professor York.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. *Tu., Wed., Sat., at 9.25.*

3, 4.† *Physiological Anatomy*

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2, or its equivalent.

[5, 6.† *Comparative Morphology and Phylogeny*]

Not offered in 1912–13.

7, 8.† *Advanced Course*

11, 12.† *Physiology*

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2, and 3, 4, or 5, 6, and for Graduates.

CHEMISTRY

1, 2. *Descriptive Chemistry*

Professor BUCHER *and Mr.* HOLT.

Three hours. Through the year. Elective for Undergraduates. *Tu., Th., Sat., at 12.25.* Laboratory hours to be arranged with the instructor.

3, 4.† *Qualitative and Quantitative Analysis*

Professor APPLETON *and Mr.* CASWELL.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2. *1st div., Fri. at 11.20; 2d div., Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

5, 6.† *Quantitative Analysis, Advanced Course*

Professor APPLETON *and Mr.* CASWELL.

Six hours. Twelve hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3, 4. Laboratory hours to be arranged with the instructor.

7, 8.† *Organic Chemistry*

Professor BUCHER *and Mr.* HOLT.

Six hours. Through the year. Elective for approved Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

10.† *Assaying*

Professor APPLETON *and Mr.* CASWELL.

Six hours. Twelve hours of attendance. Second semester. Elective for Seniors and Graduates who have credit for 1-4.

12.† *Organic Dyes*

Professor Appleton *and Mr.* Caswell.

Six hours. Twelve hours of attendance. Second semester. Elective for approved Seniors and Graduates.

[15, 16.† *Physical Chemistry*]

Not offered in 1912–13.

20.† *Inorganic Chemistry, Advanced Course*

Professor Bucher.

Three hours. Second semester. Elective for approved Juniors, Seniors, and Graduates.

21, 22.† *Organic Preparations, Advanced Course*

Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

23, 24.† *Inorganic Preparations, Advanced Course*

Professor Bucher.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 7, 8.

27, 28.† *Conference on Special Topics in Chemistry*

Professor Bucher.

One hour. Through the year. Elective for approved students.

29, 30.† *Conference on Special Topics in Chemistry*

Professor Appleton.

One hour. Through the year. Elective for approved students.

ECONOMICS

1. *Elementary Economics*

Professor Motley.

Three hours. In connection with Social and Political Science 1 constitutes a year course required in Sophomore, Junior, or Senior year of candidates for the degree of Bachelor of Arts. Elective for others. Beginning with the class entering in 1911, required in Sophomore, Junior, or Senior year, of candidates for the degree of Bachelor of Philosophy. First semester. *Tu., Th., Sat., at 12.25.*

[5, 6.† *Money and Banking*]
Not offered in 1912–13.

7. *Socialism and Labor Problems*
Professor MOTLEY.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.25.*

10.† *Tariff, Reciprocity, and Shipping Subsidies*
Professor MOTLEY.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

11, 12.† *Public Finance and Financial History*
Professor GARDNER.

Three hours. Through the year. *Wed., Fri., Sat., at 11.20.*

13.† *Statistics*
Professor GARDNER.

Three hours. First semester. *Tu., Th., Sat., at 12.20.*

14.† *Accounting*
Professor GARDNER.

Three hours. Second semester. *Tu., Th., Sat., at 12.20.*

15.† *Trade and Transportation*
Professor MOTLEY.

Three hours. First semester. *Mon., Wed., Th., at 10.20.*

16.† *Corporations and Corporation Finance*
Professor MOTLEY.

Three hours. Second semester. *Mon., Wed., Th., at 10.20.*

21, 22.† *Investigation of Special Topics*
Professor GARDNER.

Three hours. Six hours of attendance. Through the year. Either semester may be elected independently. Students intending to take either of these courses must secure the permission of the head of the department not later than December 1 or June 1 in the semester preceding that in which they desire to take the course. It is expected that as a rule these courses will be taken in connection with lecture courses. Hours to be arranged with the instructor.

23, 24.† *Economic Seminary*

Professors Gardner *and* Motley.

Three hours. Two hours of attendance. Through the year. Elective for Seniors and Graduates who have taken advanced work in Economics. Hours to be arranged with the instructor.

EDUCATION

1. *History of Education*

Professor Jacobs.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.25.*

2. *Principles of Education*

Professor Jacobs.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.25.*

3. *The Process of Education; its Psychology and Hygiene*

Professor Jacobs.

Three hours. First semester. Elective for students who have credit for 1 or 2, or who are taking 1, and for Graduates. *Mon., Th., Fri., at 9.25.*

4. *Practical Introduction to Teaching*

Professor Jacobs.

Three hours. Second semester. Elective for students who have credit for or are taking other courses in Education, and for Graduates. *Mon., Th., Fri., at 9.25.*

ENGLISH

1. *Rhetoric and Composition*

Messrs. W. T. Hastings, Harkness, *and* Grose.

Three hours. First semester. Required of all Freshmen. *1st div., Mon., Th., Fri., at 9.25; 2d div., Tu., Wed., Sat., at 9.25.*

48. *English Literature from the Beginning to 1798*

Messrs. Hastings, Harkness, *and* Grose.

Three hours. Second semester. Required in the Freshman year of all candidates for the degree of Bachelor of Arts or Bachelor of Philosophy. In 1912–

13 elective for Sophomores. *1st div., Mon., Th., Fri., at 9.25; 2d div., Tu., Wed., Sat., at 9.25.*

[5, 6. *English Composition, Advanced Course*]

Not offered in 1912–13.

7, 8. *Argumentative Composition*

Professor HUNTINGTON *and Mr.* HASTINGS.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors; required in the Sophomore year of candidates for the degree of Bachelor of Philosophy who did not take mathematics in their Freshman year. *Wed., Fri., Sat., at 11.25.*

11, 12. *Public Speaking*

Professor CROSBY.

Three hours. Through the year. Elective for Sophomores and Juniors. *Tu., Fri., Sat., at 10.25.*

15, 16.† *Old English*

Professor POTTER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 4.20.*

17, 18.† *Chaucer*

Professor POTTER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 3.20.*

[21, 22. *The Drama in England to 1642*]

Not offered in 1912–13.

[23. *The Modern English Drama*]

Not offered in 1912–13.

[25, 26. *Shakspere*]

Not offered in 1912–13.

27, 28. *Shakspere*

Professor POTTER.

Three hours. Through the year. Elective for Juniors and Seniors. *Tu., Th., Sat., at 12.25.*

31, 32. *English Literature from 1660 to 1798*

Professor HUNTINGTON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for a year's work in English Literature. ***Mon., Th., Fri., at 9.25.***

35. *English Literature from 1798 to 1832, Poetry*

Professor BENEDICT.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. First semester. Elective for Sophomores, Juniors, and Seniors. ***Tu., Wed., Sat., at 9.25.***

36. *English Literature from 1798 to 1832, Prose*

Professor BENEDICT.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Second semester. Elective for Sophomores, Juniors, and Seniors. ***Tu., Wed., Sat., at 9.25.***

37. *English Literature from 1832 to 1892, Prose*

Professor BRONSON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. First semester. Elective for Sophomores, Juniors, and Seniors. ***Tu., Th., Sat., at 12.25.***

38. *English Literature from 1832 to 1892, Poetry*

Professor BRONSON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Second semester. Elective for Sophomores, Juniors, and Seniors. ***Tu., Th., Sat., at 12.25.***

[39, 40. *American Literature*]

Not offered in 1912–13.

[42. *Contemporary English and American Literature*]

Not offered in 1912–13.

43, 44.† *Seminary in English Literature*

Three hours. Two hours of attendance. Through the year. Elective for Graduates, and for a limited number of Seniors who have attained the grade of C in two years' work in English Literature.

GEOLOGY

1. *General Geology*

Professor Brown.

Three hours. First semester. Elective for Undergraduates. *Wed., Fri., Sat., at 11.25.*

6. *Economic Geography and Conservation*

Professor Brown.

Three hours. Second semester. Elective for Undergraduates who have credit for 1 or 5, or who presented Physiography for admission, except Freshmen and Sophomores who are taking another course in the department. *Wed., Fri., Sat., at 11.25.*

11, 12.† *Research in Geology and Geography*

One to six hours. Through the year. Elective for Graduates and approved Undergraduates. Either semester may be elected independently.

GERMANIC LANGUAGES AND LITERATURES

1, 2. *Elementary Course, First Year*

Mr. Mitchell.

Three hours. Through the year. Elective for students who did not present German for admission. *Mon., Wed., Fri., at 12.25.*

3, 4. *Elementary Course, Second Year*

Professor Crowell.

Three hours. Through the year. Elective for students who have credit for 1, 2. *Mon., Tu., Th., at 11.25.*

5, 6. *Intermediate Course*

Mr. Keenan.

Three hours. Through the year. Elective for Freshmen who presented elementary German for admission. Not elective for students who have taken German in college. *Mon., Wed., Fri., at 12.25.*

7, 8. *Advanced Course in Standard Authors, Classical and Modern*

Mr. Bachmann.

Three hours. Through the year. Elective for students who have credit for 3, 4; 5, 6; or 9, 10; or who presented advanced German for admission. *Mon., Wed., Fri., at 12.25.*

9, 10.† *Modern Prose*

Messrs. MITCHELL *and* KEENAN.

Three hours. Through the year. Elective for students who have credit for 3, 4; 5, 6; or 7, 8; or who presented advanced German for admission. *Tu., Fri., Sat., at 10.20.*

15, 16. *The German Drama of the Nineteenth Century*

Mr. RAND.

Three hours. Through the year. Elective for students who have credit for 3, 4; 7, 8; 9, 10. *Tu., Wed., Sat., at 9.25.*

17, 18.† *Lessing and Schiller*

Professor CROWELL.

Three hours. Through the year. Elective for students who have credit for 7, 8; 9, 10. *Mon., Wed., Fri., at 12.20.*

[21, 22.† *Goethe's Faust: Parts* 1 *and* 2]

Not offered in 1912–13.

[25, 26.† *Outline History of German Literature*]

Not offered in 1912–13.

27, 28.† *German Literature in the Nineteenth Century*

Mr. MITCHELL.

Three hours. Through the year. Elective for students who have credit for 7, 8; 9, 10. *Tu., Th., Sat., at 12.20.*

31.† *Gothic*

Professor CROWELL.

Three hours. First semester. Elective for Graduates and approved Undergraduates. *Wed., Fri., Sat., at 11.20.*

32.† *Old High German*

Professor CROWELL.

Three hours. Second semester. Elective for Graduates and approved Undergraduates. *Wed., Fri., Sat., at 11.20.*

[33.† *Old Norse*]

Not offered in 1912–13.

[34.† *Germanic Mythology*]

Professor CROWELL.

Three hours. Second semester. Elective for Graduates and approved Undergraduates. Not offered in 1912–13.

[35, 36.† *Middle High German*]

Not offered in 1912–13.

GREEK LITERATURE AND HISTORY

A, B. *Elementary Course*

Three hours. Through the year. Elective for students who did not present elementary and advanced Greek for admission. *Wed., Fri., Sat., at 11.25.*

1. *Homer and the Greek Anthology*

Professor Manatt. [This year *Professor* Terrell.]

Three hours. First semester. Elective for students who presented elementary and advanced Greek for admission, or who have credit for A, B, and have done the additional work indicated above. *Mon., Tu., Th., at 11.25.*

2. *Lysias and Plato*

Professor Allinson.

Three hours. Second semester. Elective for students who have credit for 1. *Mon., Tu., Th., at 11.25.*

3. *Lucian and the Dramatic Poets*

Professor Allinson.

Three hours. First semester. Elective for Sophomores. *Wed., Fri., Sat., at 11.25.*

4. *The Historians*

Professor Manatt. [This year *Professor* Terrell.]

Three hours. Second semester. Elective for Sophomores. *Wed., Fri., Sat., at 11.25.*

[5. *Epic Poetry*]

Not offered in 1912–13.

[6. *The Drama*]

Not offered in 1912–13.

7. *Lyric and Pastoral Poetry*

Professor Manatt. [This year *Professor* Terrell.]

Three hours. First semester. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.25.*

8. *Plato, Aristotle, and Aeschylus*

Plato: selections from the *Republic*. Aristotle: the *Constitution of Athens.* Aeschylus: the *Agamemnon,* with collateral reading of the rest of the *Oresteia. Professor* ALLINSON.

Three hours. Second semester. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.25.*

[9. *The Attic Orators*]

Not offered in 1912–13.

[10. *Lucian and Pausanias*]

Not offered in 1912–13.

15. *Greek Civilization*

Professor ALLINSON.

Three hours. Second semester. Required of all candidates for the degree of Bachelor of Philosophy. *Mon., Wed., Fri., at 12.25.*

17, 18.† *Greek Seminary*

Three hours. Two hours of attendance. Through the year. Elective for Graduates and approved Seniors.

20. *Introduction to Greek Archaeology*

Outline of the remains of the earliest Greek civilization; an introductory study of Greek vases, coins, small bronzes, and terra-cotta figurines. Intended to give a general survey of these sources for Greek history and life. Illustrated lectures; collateral reading. *Professor* KING.

Three hours. Second semester. Elective for students who have completed one course in Latin or Greek. *Mon., Th., Fri., at 9.25.*

HISTORY

1, 2. *Medieval and Modern History of Europe*

Professor MACDONALD.

Three hours. Through the year. Required of candidates for the degree of Bachelor of Arts in the Sophomore or Junior year, and of candidates for the degree of Bachelor of Philosophy in the Freshman, Sophomore, or Junior year. *Mon., Tu., Th., at 11.25.*

3.† *Early and Medieval Christianity*

Professor Collier.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. Introductory to 4. *Tu., Wed., Sat., at 9.20.*

4.† *The Reformation*

Professor Collier.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. A continuation of 3, by which it should preferably be preceded. *Tu., Wed., Sat., at 9.20.*

[5. *The French Revolution and the Napoleonic Era*]

Not offered in 1912–13.

[6. *Europe since 1815*]

Not offered in 1912–13.

7. *English History, 1066–1689*

Professor Collier.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. Introductory to 8. *Mon., Tu., Th., at 11.25.*

8. *English History, 1689–1895*

Professor Collier.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates, and for Sophomores who have credit for 1, 2. A continuation of 7, by which it should preferably be preceded. *Mon., Tu., Th., at 11.25.*

11, 12.† *Seminary in European History*

Professor Collier.

Three hours. One to two hours of attendance. Through the year. Elective for Graduates and approved Seniors.

13, 14. *American History*

Professor MacDonald.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates, and for Sophomores who have credit for 1, 2. Either semester may be elected independently, but 14 should preferably be preceded by 13. *Tu., Fri., Sat., at 10.25.*

[15, 16.† *Constitutional and Political History of the United States*]

Not offered in 1912–13.

17, 18.† *Seminary in American History*

Professor MacDonald.

Three hours. One to two hours of attendance. Through the year. Elective for Graduates and approved Seniors. The course should be preceded by 13, 14, or 15, 16, or 19, 20, but in exceptional cases may be taken by students who at the same time are taking 13, 14, or 15, 16, or 19, 20.

19.† *Social History of America to 1800*

Professor MacDonald.

Three hours. Two hours of attendance. First semester. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., at 12.20.*

20.† *History of the United States since 1860*

Professor MacDonald.

Three hours. Two hours of attendance. Second semester. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., at 12.20.*

INDO-EUROPEAN PHILOLOGY

[2. *General Introduction to the Study of Language*]

Professor Allinson.

Not offered in 1912–13.

MATHEMATICS

INTRODUCTORY STATEMENT

For students who present only Algebra and Plane Geometry for admission. Candidates for the degree of Bachelor of Arts, and those candidates for the degree of Bachelor of Philosophy who do not elect to take Argumentation in the Sophomore year, are required to take one of the following combinations of courses: (A) 1, 2; (B) 3, 4; (C) 3, 2. Students who intend to specialize in Mathematics are advised to take both 1, 2 and 3, 4 (or 17, 18); but if only three hours can be taken in the Freshman year, it is advisable to elect 3, 2.

For students who present Solid Geometry and Plane Trigonometry for admission. Candidates for the degree of Bachelor of Arts, and those candidates for the degree of Bachelor of Philosophy who do not elect to take Argumentation in the Sophomore year, are required to take one of the following combinations of courses: (A) 3, 4; (B) 5, 6; (C) 5, 12. Students who intend to specialize in Mathematics are advised to take both 3, 4 and 5, 6; but if only one course can be taken in the Freshman year, it is advisable to take 5, 6.

1. *Solid and Spherical Geometry*

Professors MANNING *and* RICHARDSON.

Three hours. First semester. Required as noted in Introductory Statement. Elective for other Undergraduates who did not present Solid Geometry for admission. *Tu., Fri., Sat., at 10.25.*

2. *Plane Trigonometry*

Professors MANNING *and* RICHARDSON.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for other Undergraduates who did not present Plane Trigonometry for admission. *Tu., Fri., Sat., at 10.25.*

[3. *Algebra*]

Not offered in 1912–13.

[4. *Algebra*]

Not offered in 1912–13.

5. *Plane Analytic Geometry*

Professor DAVIS.

Three hours. First semester. Required as noted in Introductory Statement. Elective for students who have credit for Plane Trigonometry. *Mon., Wed., Th., at 10.25.*

6. *Differential Calculus*

Professor DAVIS.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for students who have credit for 5. *Mon., Wed., Th., at 10.25.*

7, 8.† *Differential and Integral Calculus*

Professor ARCHIBALD.

Three hours. Through the year. Elective for students who have credit for 6. *Tu., Th., Sat., at 12.20.*

9.† *Differential Equations*

Professor MANNING.

Three hours. First semester. Elective for students who have credit for 8 or 20. *Tu., Th., Sat., at 12.20.*

9 a.† *Differential Equations*

Professor Manning.

Two hours. First semester. Required of candidates for the degree of Bachelor of Science in Electrical Engineering. *Tu., Th., at 12.20.*

10.† *Differential Equations*

Professor Manning.

Three hours. Second semester. Elective for students who have credit for 9. *Tu., Th., Sat., at 12.20.*

12.† *Modern Analytic Geometry*

Professor Manning.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for students who have credit for 5. *Mon., Wed., Fri., at 12.20.*

[21, 22.† *Function Theory of a Complex Variable*]

Three hours. Through the year. Elective for Graduates and approved Seniors. Not offered in 1912–13.

25, 26.† *Advanced Algebra*

Professor Richardson.

Three hours. Through the year. Elective by special permission of the instructor.

29, 30.† *Function Theory of a Real Variable*

Professor Richardson.

Three hours. Through the year. Elective for students who have credit for 25, 26, and for others by special permission.

43, 44. *Foundations, Methods, and Problems of Geometry*

Professor Archibald.

Three hours. Through the year. Elective for Graduates and Undergraduates who have credit for 3, 4, or 25, 26, and for others by special permission. *Mon., Th., Fri., at 9.25.*

MUSIC

3. *Advanced Harmony*

Professor Macdougall.

Three hours. First semester. Elective for students who have credit for Elementary Harmony [Music 2] or its equivalent. *Mon., Wed., at 12.25.*

4. *The Opera*

The development of the opera from 1600 to the present day. Designed to give familiarity with the more famous operas, especially those in the modern operatic repertoire. Assigned readings, written tests, written reports. *Professor* MACDOUGALL.

Three hours. Second semester. Elective for Sophomores, Juniors, and Seniors. No previous knowledge of music required. *Mon., Wed., at 12.25.*

PHILOSOPHY

3. *Psychology*

A survey of the main facts and laws of mental life, aiming to provide a sound foundation for further acquaintance with this and allied subjects, for an improved judgment in dealing with many practical problems, and for understanding the psychological bases of philosophy. *Professor* DELABARRE.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Th., Sat., at 12.25.*

4. *Ethics*

An introductory course dealing in a concrete way with the moral values of daily experience, and intended to aid the student in forming a practical philosophy of life. *Professor* EVERETT.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates who have credit for a year course in Philosophy. Preceded by Philosophy 9. *Mon., Wed., Th., at 10.25.*

[7, 8. *History of Philosophy*]

Not offered in 1912–13.

9. *Philosophy of Religion*

Professor EVERETT.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates who have credit for a year course in Philosophy. To be followed by Philosophy 4. *Mon., Wed., Th., at 10.25.*

11, 12.† *Experimental Psychology, Introductory Laboratory Course*

Professor DELABARRE.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3.

[13, 14.† *Problems of Modern Philosophy*]

Not offered in 1912–13.

15, 16.† *Kantian and Post-Kantian Philosophy*

Professor MEIKLEJOHN.

Three hours. Through the year. Elective for Seniors who have credit for 7, 8, and for Graduates.

17, 18.† *Psychology, Advanced Course*

Professor DELABARRE.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3.

19, 20.† *Experimental Psychology, Advanced Laboratory Course*

Professor DELABARRE.

One to six hours. Two to twelve hours of attendance. Through the year. Elective for students who have credit for 11, 12. May be taken for more than six hours by Graduates.

20, 21.† *Advanced Ethics*

Professor EVERETT.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for a year course in philosophy.

[23, 24.† *Philosophical Seminary*]

Not offered in 1912–13.

PHYSICS

1, 2. *Elementary Physics*

Professor BARUS.

Three hours. Through the year. Required of all candidates for the degree of Bachelor of Science. Elective for Undergraduates who have credit for entrance algebra and plane geometry. *Mon., Tu., Th., at 11.25.*

3, 4.† *Elementary Physics, continued*

Professor BARUS.

Three hours. Through the year. Elective for students who have credit for 1, 2, and Mathematics 1, 2. *Tu., Fri., Sat., at 10.20.*

5, 6.† *Experimental Physics*

Professor PALMER.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2.

7, 8.† *Mathematical Treatment of Dynamical Problems*

Professor PALMER.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 5, 6, and Mathematics 9, 10.

9, 10.† *Mathematical Theory of Electricity and Magnetism*

Professor PALMER.

Three hours. Through the year. Elective for Graduates and Seniors who have credit for 5, 6, and Mathematics 9, 10.

11, 12.† *Advanced Laboratory Course*

Professors BARUS, PALMER, *and* WATSON.

Three or six hours. Six or twelve hours of attendance. Through the year. Elective for students who have credit for 5, 6.

13, 14.† *Applied Harmonic Analysis and Applied Vector Analysis*

Professor BARUS.

Three hours. Through the year. Required in the second semester of candidates for the degree of Bachelor of Science in Electrical Engineering. Elective for Seniors and Graduates who have credit for 1, 2, and Mathematics 7, 8.

15, 16.† *Physics, Advanced Course*

Professor BARUS.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for Mathematics 7, 8.

23, 24.† *Precision Measurements in Photometry, Electricity, and Magnetism*

Professor PALMER.

Four hours. Eight hours in the laboratory. Through the year. Elective for students who have credit for 5, 6, or 21, 22, and Mathematics 7, 8, or 19, 20.

25, 26.† *Radiation, Optics, and Heat*

Professor PALMER.

Three or six hours. Six or twelve hours in the laboratory. Through the year. Elective for students who have credit for 5, 6, or 21, 22.

ROMAN LITERATURE AND HISTORY

1. *Livy*

Professors Harkness *and* Greene.

Three hours. First semester. Elective for students who presented elementary and advanced Latin for admission. *Mon., Tu., Th., at 2.25.*

2. *Cicero's Letters*

Professor Greene.

Three hours. Second semester. Elective for students who presented elementary and advanced Latin for admission. *Mon., Tu., Th., at 2.25.*

3. *Catullus and Virgil*

Professor King.

Three hours. First semester. Elective for Sophomores. *Mon., Th., Fri., at 9.25.*

4. *Horace's Satires, Juvenal*

Professor Harkness.

Three hours. Second semester. Elective for Sophomores. *Tu., Fri., Sat., at 10.25.*

[5, 6. *Latin Poetry*]

Not offered in 1912–13.

7, 8. *Latin Prose*

Professors Harkness *and* Greene.

Three hours. Through the year. Elective for Juniors and Seniors. Either semester may be elected independently. *Tu., Th., Sat., at 12.25.*

11, 12. *Latin Composition*

Professor Greene.

One hour. Through the year. Elective for Sophomores, Juniors, and Seniors. *Fri. at 2.25.*

16. *Roman Civilization*

Professor Greene.

Three hours. First semester. Required in the Freshman or Sophomore year of candidates for the degree of Bachelor of Philosophy. *Mon., Wed., Fri., at 12.25.*

ROMANCE LANGUAGES AND LITERATURES

1, 2. *Elementary Course, First Year*

Mr. Micoleau.

Three hours. Through the year. Elective for students who did not present French for admission. *Mon., Wed., Th., at 10.25.*

5, 6. *Intermediate Course*

Professor Hunkins.

Three hours. Through the year. Elective for students who have credit for 3, 4, or who presented elementary French for admission. *Mon., Wed., Th., at 10.25.*

7, 8. *Advanced Course*

Professor Johnson.

Three hours. Through the year. Elective for students who have credit for 5, 6, or who presented advanced French for admission. *Tu., Wed., Sat., at 9.25.*

[9, 10. *The Realistic School*]

Not offered in 1912–13.

11, 12. *The Romantic School*

Professor Langdon.

Three hours. Through the year. Elective for students who have credit for 7, 8. *Tu., Wed., Sat., at 9.25.*

15, 16.† *Modern Spanish*

Professor Johnson.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern language. *Tu., Fri., Sat., at 10.20.*

17, 18.† *Modern Italian*

Professor Langdon.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern language. *Mon., Th., Fri., at 9.20.*

19, 20. *Dante in English*

Professor Langdon.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Students are advised to elect this course in their Senior year. *Wed., Fri., Sat., at 11.25.*

21, 22.† *Spanish Language and Literature*

Professor Johnson.

Three hours. Through the year. Elective for students who have credit for 15, 16. *Wed., Fri., Sat., at 11.20.*

23, 24. *Practice in Writing and Speaking French*

Professor Johnson.

Three hours. Through the year. Elective for students who have credit for 7, 8. *Mon., Wed., Th., at 10.25.*

SOCIAL AND POLITICAL SCIENCE

SOCIAL SCIENCE

1. *Elementary Social and Political Science*

Professor Dealey.

Three hours. In connection with Economics 1 constitutes a year course required in Sophomore, Junior, or Senior year of candidates for the degree of Bachelor of Arts and Bachelor of Philosophy. Elective for others. Second semester. *Tu., Th., Sat., at 12.25.*

3, 4. *Social Problems and Conditions*

Professor Dealey.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.25.*

7.† *Sociology as a Science*

Professor Ward.

Three hours. First semester. Followed in the second semester by 8. Elective for Seniors and Graduates. *Wed., Fri., Sat., at 11.20.*

8.† *Application of Sociological Principles*

Professor Ward.

Three hours. Second semester. Preceded by either 5, 6, or 7. Elective for Seniors and Graduates. *Wed., Fri., Sat., at 11.20.*

9, 10.† *Sociological Aspects of Education*

Professor Ward.

Three hours. Through the year. Elective for Seniors and Graduates. *Tu., Fri., 4.30 to 6.*

11, 12.† *Sociological Theories*

Professor Dealey.

Three hours. Through the year. Offered if applied for by Graduates.

13, 14.† *Investigation of Special Topics*

Professor Dealey.

Three hours. Six hours of attendance. Through the year. Elective for Graduates, and for a limited number of approved Juniors and Seniors. Either semester may be elected independently.

POLITICAL SCIENCE

1. *Elementary Political and Social Science*

See Social Science 1.

3, 4. *Government and Politics of the United States*

Dr. Dunning.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Fri., Sat., at 10.25.*

11, 12.† *Current Social and Political Theory and Practice*

A seminary course. Intended to train students in methods of estimating the value and significance of recent publications on social and political topics. Study of current problems arising through changing social conditions. Special attention is given to publications in German and French. *Dr.* Dunning.

One hour. Through the year. Elective for Graduates and approved Seniors. *Mon. at 5.*

HYGIENE AND PHYSICAL EDUCATION

M. Elizabeth Bates, *Instructor.*

From the close of the Thanksgiving recess to the Spring recess, all first and second year students are required to attend classes in the gymnasium three times a week. Seniors and Juniors may take elective work. All students are carefully examined before class work is assigned.

Freshman Class. Gymnastics, games, dancing, and conferences in practical hygiene. Three hours. *Mon., Tu., Th., 3.25 to 4.10.*

Sophomore Class. Gymnastics, games, dancing, and conferences in practical hygiene. More advanced than the Freshman work. Three hours. *Mon., Tu., Th., 2.30 to 3.15.*

A class in light gymnastics, games, and dancing will be held for students who, because of their organic condition, or of temporary disability, are unable to take the regular class work.

Special remedial work will be given to students who have round shoulders, lateral curvature, or flat foot, of a functional nature.

Seniors and Juniors may elect one or two hours in the Freshman or Sophomore class.

A course in games, plays, and folk dances suitable for elementary schools, playgrounds, or social settlements will be given. One hour. Elective for Seniors and Juniors.

ANNOUNCEMENT OF COURSES
OFFERED IN
BROWN UNIVERSITY
1912–1913

PROVIDENCE, RHODE ISLAND
PUBLISHED BY THE UNIVERSITY
1912

CALENDAR 1912–1913

Vacations and holidays occurring within the academic year 1912–13 are indicated by dark type.

1912

JULY

S	M	T	W	T	F	S
..	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	..	..	..

AUG.

S	M	T	W	T	F	S
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11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

SEPT.

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OCT.

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NOV.

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17	18	19	20	21	22	23
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DEC.

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1913

JAN.

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FEB.

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MAR.

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APR.

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MAY

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JUNE

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1913

JULY

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AUG.

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SEPT.

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OCT.

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NOV.

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DEC.

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14	15	16	17	18	19	20
21	22	23	24	25	26	27
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THE UNIVERSITY CALENDAR 1912–13

1912

September 4.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
September 18–23.	*Wednesday, Thursday, Friday, Saturday, and Monday.* Examinations for admission to the Freshman class and to advanced standing.
September 23, 24.	*Monday and Tuesday.* Registration of new students and enrolment of students previously in residence.
September 25.	*Wednesday.* Academic Year begins (fourth Wednesday in September). Last day for registration of Graduate students.
October 5.	*Saturday.* Examination in Greek for the President's Premiums, 5 Maxcy Hall, 2.30 p.m.
October 9.	*Wednesday.* Examination in Latin for the President's Premiums, 1 Sayles Hall, 2.30 p.m.
October 12.	*Saturday.* Examination in Mathematics for the Hartshorn Premiums, 27 Wilson Hall, 2 p.m.
October 16.	*Wednesday.* Examination in French for the Hicks Premiums, 1 Sayles Hall, 2.30 p.m.
October 19.	*Saturday.* Examination in German for the Hicks Premiums, 5 Sayles Hall, 2.30 p.m.
November 28.	*Thursday.* Thanksgiving Day. No University exercises.
December 4.	*Wednesday.* Preliminary discussion for the Class of 1880 Prizes.
December 6.	*Friday.* Last day for receiving essays submitted in competition for the Class of 1880 Prizes.
December 11.	*Wednesday.* Public discussion for the Class of 1880 Prizes.
Dec. 23, 1912, to Jan. 2, 1913.	*Monday to Thursday.* Christmas Recess.

1913

February 1.	*Saturday.* Last day for applications of competitors for the Carpenter Prizes in Elocution.
Jan. 27 to Feb. 6.	*Monday to Thursday.* Semester examinations.
February 7–11.	*Friday to Tuesday.* Mid-year Recess.
February 10, 11.	*Monday and Tuesday.* Enrolment of Undergraduate students.
February 12.	*Wednesday.* Second Semester begins.
February 22.	*Saturday.* Washington's Birthday. No University exercises.
March 26.	*Wednesday.* Last day for receiving essays submitted in competition for the Gaston Prize Medal.
April 1.	*Tuesday.* Last day for receiving applications for examination for the degree of Doctor of Philosophy, or of Master of Arts *in absentia.*
April 3–9.	*Thursday to Wednesday.* Spring Recess.
April 15.	*Tuesday.* Last day for receiving applications for the Grand Army of the Republic Fellowship.
April 29.	*Tuesday.* Carpenter Prize Speaking Competition.
April 30.	*Wednesday.* Last day for receiving theses of candidates for the degree of Doctor of Philosophy.
May 3.	*Saturday.* Last day for receiving essays submitted in competition for the Bishop McVickar prizes.
May 6.	*Tuesday.* Gaston Prize Medal Competition.
May 13.	*Tuesday.* Hicks Prize Debate.
May 30.	*Friday.* Memorial Day. No University exercises.
May 31.	*Saturday.* Last day for examinations for advanced degrees.
June 3–13.	*Tuesday to Friday.* Semester examinations.
June 15.	*Sunday.* Baccalaureate Sermon, First Baptist Meeting House, 4.30 p.m.
June 16.	*Monday.* Class Day.

June 17.	*Tuesday.* Annual Meeting of the Phi Beta Kappa Society, Administration Building, 9.30 a.m. Ivy Day, Pembroke Hall. Annual Meeting of the Associated Alumni, Manning Hall, 2.30 p.m.
June 18.	*Wednesday.* One Hundred and Forty-Fifth Annual Commencement (third Wednesday in June), First Baptist Meeting House, 10 a.m.
June 19.	*Thursday.* Meeting of the Corporation.
June 19 to Sept. 23.	Summer Vacation.
September 3.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
September 17–22.	*Wednesday, Thursday, Friday, Saturday, and Monday.* Examinations for admission to the Freshman class and to advanced standing.
September 22, 23.	*Monday and Tuesday.* Registration of new students and enrolment of students previously in residence.
September 24.	*Wednesday.* Academic Year begins (fourth Wednesday in September).

REGISTRATION AND ENROLMENT

REGISTRATION AND ENROLMENT OF UNDERGRADUATES

REGISTRATION. In September all new students, whether candidates for a degree or special students, must report at the Administration Building between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first semester, and fill out registration cards for the whole of the ensuing year. Failure to comply with this rule will be treated as late registration and a fee of three dollars will be charged. All new students must present at or before the time of registration all credentials necessary for admission as candidates for a degree or as special students.

In May of each year all undergraduates in residence, whether candidates for a degree or special students, must obtain at the Registrar's office registration cards, which must be filled out with a statement of the courses elected for the whole of the ensuing year, and returned not later than June 1. Failure to comply with this rule will be treated as late registration and a fee of three dollars will be charged.

Courses described in one paragraph (*e.g.* Biology 1, 2) must be elected as a whole and the second semester may not be taken without the first, unless specific statement to the contrary is made. In starred courses a final mark will be given at the end of the course, the mark given at the end of the first semester being regarded as temporary. Changes in registration will be allowed only on presentation of sufficient reasons to the Committee on Registration and Attendance. Requests for permission to make changes in September must be presented to the committee between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first semester. Requests for permission to make changes for the second semester must be presented to the committee before the beginning of the examinations of the first semester, unless these requests are the result of failures, in which case they must be presented in writing to the Registrar two days before the opening of the second semester.

ENROLMENT. All students must report at the Registrar's office between 9 a.m. and 5 p.m. on one of the two days preceding the opening of each semester and have their names checked as enrolled. Failure to report will be treated as late enrolment and a fee of three dollars will be charged.

GRADUATE STUDENTS

Graduate students must report to the Dean of the Graduate Department in No. 5 Wilson Hall between 9 a.m. and 1 p.m. or between 3 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of each semester. Before entering classes they must present their registration cards at the Registrar's office and be enrolled.

UNIVERSITY FEES

FEES FOR UNDERGRADUATES. *Tuition:* $52.50 a semester; $105 a year. *Incidentals:* $24 a semester; $48 a year. *Matriculation fee* (Freshman year only): $5. *Graduation fee* (Senior year only): $8.

The incidental expenses are for the printing of programs, examination papers, and the like, the use of the library and the gymnasium, heat for these buildings and for the recitation rooms, and the wages of servants to care for them.

Special students who are taking courses amounting to less than fifteen hours a week pay in proportion to the actual amount taken.

FEES FOR RESIDENT GRADUATE STUDENTS. *Tuition:* $75 a semester; $150 a year. *Graduation fee:* for the degree of Master of Arts, $15; for the degree of Master of Science, $15; for the degree of Doctor of Philosophy, $25.

Graduate students who are taking courses amounting to less than fifteen hours a week pay $15 a semester for each three-hour course.

A candidate in residence for the degree of Master of Arts or Master of Science who has paid full tuition for one year may, if necessary to the attainment of his degree, continue his studies for one year more without additional charge.

A candidate in residence for the degree of Master of Arts, who without remitting his studies becomes a candidate for the degree of Doctor of Philosophy, is credited with whatever tuition he has already paid, in case his previous work is allowed to count toward the higher degree.

A candidate for the degree of Doctor of Philosophy who has paid full tuition for two years may, if necessary to the attainment of his degree, continue his studies for two years more without additional charge.

FEES FOR NON-RESIDENT GRADUATE STUDENTS. *Registration fee:* $25. *Tuition:* $15 a semester; $30 a year. *Examination fee:* $15.

A non-resident candidate is entitled, upon payment of the registration and tuition fees, to take one three-hour course in residence. For each additional course taken in residence a fee of $15 a semester is charged.

A non-resident candidate who has paid tuition for two years may, if necessary to the attainment of his degree, continue his studies for one year more without additional charge, except for work taken at the University.

LABORATORY FEES. In addition to the regular fees mentioned above, the following fees are charged for laboratory courses. These fees cover the cost of ordinary supplies; special supplies and breakage are charged extra. $4.50 for each three-hour semester course in *Botany*, *Biology*, *Geology*, *Elementary Chemistry*. $7.50 for each three-hour semester course in *Advanced Chemistry*, *Mechanical Engineering*, *Physics*, *Electrical Engineering*.

SPECIAL FEES. Candidates for a first degree who do not pay four years full tuition fees must pay for all extra courses counted toward the degree at the rate of $7.50 per semester for each three-hour course. This amount must be paid at the beginning of the semester preceding the completion of the degree work. This rule does not apply to courses credited from other institutions or taken during the summer.

Candidates for the degree of A.M. or Sc.M. who do not pay full tuition fees for one year, and candidates for the degree of Ph.D. who do not pay full tuition fees for two years, must pay for all extra courses counted toward the degree at the rate of $7.50 per semester for each three-hour course. This amount must be paid at the beginning of the semester preceding the completion of the degree work. This rule does not apply to courses credited from other institutions.

PAYMENT OF UNIVERSITY BILLS

Every student, graduate or undergraduate, must pay in advance, at registration for each semester, all charges for tuition and incidentals for the semester.

Students occupying dormitory rooms must also pay at the above time all room charges for the semester.

Students taking laboratory courses must also pay at the above time all laboratory fees for the semester. These fees vary from $4.50 to $7.50 for each three-hour laboratory course.

At the beginning of the second semester all students occupying dormitory rooms or taking laboratory courses must, in addition to the payment of the above amounts, make a deposit of $5 toward charges for light or breakage during the semester.

Freshmen, candidates for degrees, must pay at registration for the first semester a matriculation fee of $5.

Candidates for graduation in any year must pay all graduation fees at the beginning of the second semester of that year.

REQUIREMENTS FOR DEGREES

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REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ARTS

I. PRESCRIBED SUBJECTS

Ancient Languages (either Latin or Greek, or both). Six hours. At least three hours must be taken in the Freshman year, and the six hours must be completed by the end of the Sophomore year.

Modern Languages (*for students who entered before 1911*). Six hours. At least three hours must be taken in the Freshman year, and the six hours must be completed by the end of the Sophomore year.

Students presenting elementary French only must continue French in the Freshman year and take elementary German in either the Freshman or the Sophomore year. Students presenting elementary German only must continue German in the Freshman year and take elementary French in either the Freshman or the Sophomore year. Students presenting elementary French and elementary German only must continue both languages, but may postpone the continuation of one language until the Sophomore year. Students presenting elementary work in one language and elementary and advanced work in the other must take in the Freshman year the language in which the elementary work only was presented. Students presenting elementary and advanced work in both languages may take the required six hours in either French or German, or both.

Students who entered before 1911 will be permitted, if they desire, to substitute the following requirement in Modern Languages.

Modern Languages (*for students entering after 1910*). *Six hours. In at least one modern language the equivalent of the elementary and intermediate requirement for admission must be taken, or such portion of this requirement as was not presented for admission, and one year course* (*three hours*) *additional.*

Mathematics. Three hours. Freshman year.

English (*Rhetoric and Composition*).‡ Three hours. Freshman year.

English Literature.§ Three hours. Sophomore, Junior, or Senior year.

European History. Three hours. Sophomore or Junior year.

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‡ Students entering in 1912 will take the required courses in English as follows: Rhetoric and Composition. Three hours. First semester, Freshman year; second semester, Sophomore year. Literature. Three hours. Second semester, Freshman year; one semester, Sophomore, Junior, or Senior year.

§ Sophomores in 1912–13 may get substantially the equivalent of 19, 20, which is no longer offered, by taking in the first semester 35 or 37, and in the second semester 48.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Social and Political Science, and Economics. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. REQUIRED STUDIES. *Latin or Greek*, three hours; *French or German*, three hours; *Mathematics*, three hours; *English*, three hours.

II. ELECTIVE STUDIES. One three-hour course continuous through the year must be chosen from the following list: *Latin*, *Greek*, *French*, *German*, *Chemistry*, *Botany*, *Biology*, *Geology*, *Mechanical Drawing.*

SOPHOMORE YEAR

That portion of the required work in ancient and modern languages not completed in the Freshman year, and other required and elective courses sufficient to make a total of fifteen hours a week.

JUNIOR YEAR

The required History and Physical or Natural Science, if not previously taken, and other required and elective courses sufficient to make a total of fifteen hours a week.

SENIOR YEAR

All required courses not previously taken, and elective courses sufficient to make a total of fifteen hours a week.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF PHILOSOPHY ‡

For Students who entered before 1911

I. PRESCRIBED SUBJECTS

Modern Languages. An amount sufficient, with the work presented for admission, to complete the elementary course and a year of advanced work in both French and German. A student who is admitted in both advanced French and advanced German must continue one of these languages for one year, three hours a week.

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‡ Candidates for the degree of Bachelor of Philosophy who entered before 1911 may take advantage of the new Requirements for Concentration, may substitute the new for the old requirements in Modern Languages, and, with the consent of the departments concerned, may substitute a course in Argumentation for the required Mathematics. See the Catalogue, pages 74-77.

Mathematics. Three hours. Freshman year.

English (*Rhetoric and Composition*). Three hours. Freshman year.

European History. Three hours. Sophomore or Junior year.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year.

II. REQUIREMENTS ARRANGED BY YEARS

SOPHOMORE YEAR

That portion of the required work in modern languages not completed in the Freshman year, and other required and elective courses sufficient to make a total of fifteen hours a week.

JUNIOR YEAR

The required History and Physical or Natural Science, if not previously taken, and other required and elective courses sufficient to make a total of fifteen hours a week.

SENIOR YEAR

All required courses not previously taken, and elective courses sufficient to make a total of fifteen hours a week.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF PHILOSOPHY ‡

I. PRESCRIBED SUBJECTS

A continuous course of three hours through the year in each of the following subjects:

Mathematics. This subject may be omitted by students who elect to take Argumentation in the Sophomore year. Freshman year.

English (*Rhetoric and Composition*).§ Freshman year.

English Literature. ‖ Freshman or Sophomore year.

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‡ For Requirements for the Degree of Bachelor of Philosophy for students who entered before 1911, see pages 10, 11.

§ Students entering in 1912 will take the required courses in English as follows: Rhetoric and Composition. Three hours. First semester, Freshman year; second semester, Sophomore year. Literature. Three hours. Second semester, Freshman year; one semester, Sophomore, Junior, or Senior year.

‖ Sophomores in 1912-13 may get substantially the equivalent of 19, 20, which is no longer offered, by taking in the first semester 35 or 37, and in the second semester 48.

French or German. In at least one modern language the equivalent of the elementary and intermediate requirement for admission must be taken, or such portion of this requirement as was not presented for admission, and one three-hour year course in addition.

Biology. Freshman or Sophomore year.

Physics, Chemistry, Geology, or Astronomy. This requirement does not apply to students who presented Physics and Chemistry for admission. *Chemistry or Geology*, Freshman or Sophomore year. *Physics or Astronomy*, Sophomore year. Only one of this group required.

Philosophy. Sophomore, Junior, or Senior year.

European History. Freshman, Sophomore, or Junior year.

Social and Political Science and Economics. Sophomore, Junior, or Senior year.

Argumentation (for students who do not take Mathematics). Sophomore year.

Classical Civilization. Freshman or Sophomore year. Freshman year for students who do not take Mathematics.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. Required Studies. *English* (*Rhetoric and Composition*); *French or German* (a course in continuation of a course presented for admission); *Mathematics* (for students who do not elect to take Argumentation in the Sophomore year); *Classical Civilization* (for students who do not take Mathematics); *Biology, Chemistry, or Geology.*

II. Elective Studies. One three-hour course continuous through the year must be chosen from the following list: *Latin, Greek, French, German, Classical Civilization, History, Chemistry, Botany, Biology, Geology, Mechanical Drawing.*

SOPHOMORE YEAR

That portion of the required work in modern languages not completed in the Freshman year.

Biology; for students who did not take this course in the Freshman year.

Physics, Chemistry, Astronomy, or Geology; for students who did not present Physics and Chemistry for admission or take a course in Physical Science in the Freshman year.

Argumentation; for students who did not take Mathematics in the Freshman year.

Classical Civilization; for students who did not take this subject in the Freshman year.

English Literature; for students who did not take English 19,20 in the Freshman year.

Other required and elective courses sufficient to make a total of fifteen hours a week.

JUNIOR YEAR

The required History, if not previously taken, and other required and elective courses sufficient to make a total of fifteen hours a week.

During the Junior and Senior years a student must take at least four courses outside the department chosen for special work. See Requirements for Concentration, below.

SENIOR YEAR

All required courses not previously taken, and elective courses sufficient to make a total of fifteen hours a week.

III. REQUIREMENTS FOR CONCENTRATION

At the close of the Sophomore year each candidate for the degree of Bachelor of Philosophy must choose from the following list a department in which he intends to do special work during the Junior and Senior years, and must elect at least three courses of three hours a year each in this department. If he has not already taken a three-hour year course in the department chosen, he must elect four courses.

These courses must be selected in consultation with the head of the department and must be approved by him. When two departments are combined, the selection must be made in consultation with the head of the department first named.

At any time before the beginning of the Senior year a student may, with the approval of the Committee on Registration and Attendance, change the department in which he is to do his special work.

With the approval of the department in which the student is doing special work, he may count as the equivalent of one course, work which does not require regular class-room attendance.

LIST OF DEPARTMENTS IN WHICH SPECIAL WORK MAY BE TAKEN

Art.
Art, and Greek Literature and History.
Art, and Roman Literature and History.
Art, and Music.
Art, and History.
Astronomy.
Astronomy, and Civil Engineering.

Astronomy, and Physics.
Astronomy, and Mathematics.
Astronomy, and Geology.
Biblical Literature and History.
Biblical Literature and History, and Greek Literature and History.
Biblical Literature and History, and Philosophy.
Biology.
Botany.
Botany, and Biology.
Chemistry.
Civil Engineering.
Economics.
Education.
Education, and Philosophy.
Education, and Social and Political Science.
Education, and History.
Electrical Engineering.
English.
Geology.
Germanic Languages and Literatures.
Greek Literature and History.
Greek Literature and History, and Roman Literature and History.
Greek Literature and History, and Biblical Literature and History.
Greek Literature and History, and Indo-European Philology.
Greek Literature and History, and Art.
History.
Mathematics.
Mechanical Engineering.
Mechanics and Mechanical Drawing.
Mechanics, and any Engineering department.
Philosophy.
Physics (exclusive of Electrical Engineering).
Roman Literature and History.
Roman Literature and History, and Art.
Roman Literature and History, and Greek Literature and History.
Roman Literature and History, and Indo-European Philology.
Romance Languages and Literatures.
Social and Political Science.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN CIVIL ENGINEERING

FRESHMAN YEAR

First Semester	*Second Semester*
Mathematics 17	Mathematics 18
Mech. Drawing 1	Mech. Drawing 2
English 1	English 2

and two of the following courses, Chemistry (if not presented for admission), French, German, subject to the direction of the Committee on Registration and Attendance.

NOTE. A student who presents three units in one foreign language for admission is not required to take a course in that language in college, but may elect any course he desires, subject to the approval of the head of the Department of Civil Engineering.

SOPHOMORE YEAR

First Semester	*Second Semester*
Mathematics 19	Mathematics 20
Mech. Drawing 3	Mech. Drawing 4
Civil Engineering 1	Civil Engineering 2
Physics 1	Physics 2
‡Economics 1	‡Soc. and Pol. Science 1
	§Civil Engineering 4
	Civil Engineering 6

JUNIOR YEAR

Civil Engineering 7	Civil Engineering 8
Mechanics 1	Mechanics 2
Geology 3	Geology 4
Physics 21	Physics 22
Mech. Engineering 19	Mech. Engineering 20
Astronomy 5	Civil Engineering 10
	Civil Engineering 12

SENIOR YEAR

Civil Engineering 9	Civil Engineering 20
Civil Engineering 13	Civil Engineering 22
Civil Engineering 15	Civil Engineering 24
Civil Engineering 19	Civil Engineering 26

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‡ Or some other year course in the Department of English, or History, or Philosophy, chosen with the approval of the head of the Department of Civil Engineering.

§ Civil Engineering 4 is taken during the spring recess.

SENIOR YEAR (CONTINUED)

Civil Engineering 35	Civil Engineering 28
Elect. Engineering 1	Civil Engineering 30
Mechanics 3	Civil Engineering 32
	Civil Engineering 34
	Civil Engineering 36
	Mech. Engineering 24
	Mechanics 4

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

FRESHMAN YEAR

First Semester	*Second Semester*
Mathematics 17	Mathematics 18
Mech. Drawing 1	Mech. Drawing 2
English 1	English 2

and two of the following courses, Chemistry (if not presented for admission), French, German, subject to the direction of the Committee on Registration and Attendance.

NOTE. A student who presents three units in one foreign language for admission is not required to take a course in that language in college, but may elect any course he desires, subject to the approval of the head of the Department of Electrical Engineering.

SOPHOMORE YEAR

Mathematics 19	Mathematics 20
Mech. Drawing 3	Mech. Drawing 4
Mech. Drawing 5	Mech. Engineering 8
Physics 1	Physics 2
‡Economics 1	‡Soc. and Pol. Science 1
Mech. Engineering 1	Mech. Engineering 2

JUNIOR YEAR

Mechanics 1	Mechanics 2
Mech. Engineering 9	Mech. Engineering 10
Physics 21	Physics 22
Elect. Engineering 1	Elect. Engineering 2
Mech. Engineering 3	Elect. Engineering 6
Mech. Engineering 19	Mech. Engineering 20

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‡ Or some other year course, not technical, chosen with the approval of the head of the Department of Electrical Engineering.

SENIOR YEAR

Mechanics 3	Mechanics 4
Mathematics 9a	Elect. Engineering 8
	Elect. Engineering 10
Physics 23	Physics 14
Elect. Engineering 3	Elect. Engineering 4
Elect. Engineering 7	Elect. Engineering 12
Mech. Engineering 15	Mech. Engineering 16
	Civil Engineering 26
Elect. Engineering 13	Elect. Engineering 14
	Mech. Engineering 24

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

FRESHMAN YEAR

First Semester	*Second Semester*
Mathematics 17	Mathematics 18
Mech. Drawing 1	Mech. Drawing 2
English 1	English 2

and two of the following courses, Chemistry (if not presented for admission), French, German, subject to the direction of the Committee on Registration and Attendance.

NOTE. A student who presents three units in one foreign language for admission is not required to take a course in that language in college, but may elect any course he desires, subject to the approval of the head of the Department of Mechanical Engineering.

SOPHOMORE YEAR

Mathematics 19	Mathematics 20
Mech. Drawing 3	Mech. Drawing 4
Mech. Drawing 5	Mech. Engineering 8
Physics 1	Physics 2
‡Economics 1	‡Soc. and Pol. Science 1
Mech. Engineering 1	Mech. Engineering 2

JUNIOR YEAR

Mech. Engineering 19	Mech. Engineering 20
Mech. Engineering 15	Mech. Engineering 16

‡Or some other year course in the Department of English, or History, or Philosophy, chosen with the approval of the head of the Department of Mechanical Engineering.

JUNIOR YEAR (CONTINUED)

Mech. Engineering 3	Mech. Engineering 4
Mech. Engineering 9	Mech. Engineering 10
Mechanics 1	Mechanics 2
Physics 21	Physics 22

SENIOR YEAR

Mech. Engineering 21	Mech. Engineering 22
Mech. Engineering 5	Mech. Engineering 14
Mech. Engineering 17	Mech. Engineering 18
Mechanics 3	Mechanics 4
Elect. Engineering 1	Elect. Engineering 2
Mech. Engineering 11	Mech. Engineering 12
	Mech. Engineering 24
Mech. Engineering 25	Mech. Engineering 26
	Civil Engineering 34

COURSES OF INSTRUCTION

COURSES described in one paragraph (e.g. *Biology 1, 2*) *must be elected as a whole and the second semester may not be taken without the first, unless specific statement to the contrary is made. In starred courses a final mark covering the work of the course as a whole is given at the end of the course, the marks given at the end of the first semester being regarded as temporary. When the time of meeting is not announced, it will be arranged by the instructor at the beginning of the semester.*

I. ART‡

WILLIAM CAREY POLAND, A.M., LITT.D., *Professor of the History of Art*

1, 2. *History of Art from Antiquity through the Renaissance*

First semester, ancient art, chiefly Greek and Roman. Second semester, Early Christian, Byzantine, Romanesque, and Gothic art, and the art of the fifteenth and sixteenth centuries; the effect on art of the dominant motives of the epoch, the development of art in the different countries of Europe, the great masters and their most significant works. Text-book, lectures, lantern views. Students who elect this course are advised to elect also, if possible, courses 17, 18, *Advanced Drawing and Color Work.*

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. *Mon., Wed., Th., at 10.20.*

3, 4. *Modern Art, and Theory and Criticism of the Fine Arts*

First semester, the seventeenth and eighteenth centuries. Second semester, the nineteenth century, with a study of the more important facts and laws of artistic production. Text-book, lectures, special assigned topics, lantern views.

Three hours. Through the year. Course 3 is elective for students who have completed 2. Course 4 is elective for students who have completed 1, or 2, or 3. *Tu., Th., Sat., at 12.20.*

[5,* 6.* *Renaissance Art, Advanced Course*]

Critical study of the art of the fifteenth and sixteenth centuries, particularly Italian. A more detailed study of the spiritual conditions, the influences, and the masters, than in 2.

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‡ For arrangements with the Rhode Island School of Design, see the Catalogue, page 173.

Three hours. Through the year. Elective for students who have credit for 2. Not offered in 1912–13.

[7, 8. *Seminary in Greek and Roman Sculpture*]

An archaeological course based on Overbeck's *Schriftquellen.*

Three hours. Through the year. Elective for Graduates who read Greek and Latin. Not offered in 1912–13.

9. *Seminary Study of the Acropolis of Athens*

Critical reading, in Greek, of Pausanias' account of the Acropolis of Athens; lectures and illustrations.

Three hours. First semester. Elective for Graduates who read Greek and Latin. It is advised that application be made to Professor Poland at an early date.

10. *Seminary in Classical Architecture*

Critical study; reading of Vitruvius in Latin; discussion of the principles followed by the Greek and Roman architects, and of the influence of Vitruvius upon the Renaissance.

Three hours. Second semester. Elective for Graduates. Offered if three or more elect the course. It is advised that application be made to Professor Poland at an early date.

15,* 16.* *Freehand Drawing*

Training of hand and eye by study in charcoal and pencil of casts and still-life objects.

One hour. Two hours of drawing. Through the year. Elective for Undergraduates. Given at the Rhode Island School of Design. Hours to be arranged with the Director.

17,* 18.* *Advanced Drawing and Color Work*

Practical work in light and shade, and in color.

Three hours. Six hours of drawing, or four hours of drawing and one hour lecture on Historic Ornament. Through the year. Elective for students who have credit for 15, 16, and who have taken or are taking 1, 2. Given at the Rhode Island School of Design. *Mon., Tu., Wed., at 2.* Lecture hour to be arranged by the Rhode Island School of Design.

19,* 20.* *Architectural Design*

Principles of architectural design and composition taught by means of lectures, problems in design, and working drawings.

Three hours. One hour of recitation and four hours of drawing. Through the year. Elective for students who have credit for Mechanical Drawing 3, 4. Given at the Rhode Island School of Design by Mr. Huger Elliott, Director. *Mon. at 3.* Drawing hours to be arranged with the Director.

II. ASTRONOMY

Winslow Upton, A.M., Sc.D., *Professor of Astronomy*
John Edwards, *Assistant in the Ladd Observatory*

1, 2. *General Course*

Designed for general culture and preparation for technical work. Fundamental conceptions; methods of professional study. First semester, chief topic: the movements of the heavenly bodies. Second semester, chief topics: the physical condition of the heavenly bodies; the sidereal universe.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for Mathematics 1, 2. *Tu., Th., Fri., at 3.20.* Observations at Ladd Observatory.

5. *Field Astronomy*

The astronomical problems of geodesy: azimuth, time, latitude, longitude. Computations and observations.

Four hours. First semester. Required of candidates for the degree of Bachelor of Science in Civil Engineering. Elective for Juniors and Seniors who have credit for Mathematics 1, 2. *Mon., Tu., Th., Fri., at 2.20.* Observations at Ladd Observatory.

7, 8. *Advanced Astronomy*

Designed for students who wish to specialize in Astronomy.

Three hours. Through the year. Elective for approved students who have credit for 1, 2. Not given unless elected by four or more students.

9, 10. *Research Course*

Special advanced work. Subjects arranged to meet the requirements of individual students.

Elective for Graduates and approved Undergraduates.

III. BIBLICAL LITERATURE AND HISTORY‡

Henry Thatcher Fowler,† Ph.D., *Professor of Biblical Literature and History*

Earle Bennett Cross, Ph.D., *Acting Assistant Professor of Biblical Literature and History*

Nathan Stern, Ph.D., *Lecturer in Biblical Literature and History*

LANGUAGES

1, 2. *Elementary Hebrew*

Grammar; exercises in writing Hebrew; translation of parts of Genesis and Deuteronomy. *Dr.* Stern.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

3, 4. *Historical Hebrew*

Reading of the books of Samuel and Kings with special attention to the acquisition of a vocabulary; review of the elements of Hebrew grammar and study of syntax. *Dr.* Stern.

Three hours. Through the year. Elective for students who have credit for 1.

5, 6. *Hebrew Literature*

Wisdom literature. Critical translation of the Wisdom writings of the Old Testament, investigation of the characteristics and development of Hebrew reflective literature. In succeeding years corresponding courses in the Legal, Prophetic, and Psalm literature of the Old Testament will be offered. *Professor* Fowler. [This year *Professor* Cross.]

Three hours. Through the year. Elective for Graduates and approved Undergraduates.

7. *Textual Criticism of the Old Testament*

The principles and method of textual criticism, in connection with the study of one of the shorter prophetical books. *Dr.* Stern.

Three hours. One semester. Offered if applied for by Graduates.

8. *Biblical Aramaic*

Grammar and reading of the Aramaic portions of the Old Testament. *Dr.* Stern.

Three hours. One semester. Offered if applied for by students who have credit for 1.

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‡ For conditions under which students may receive credit in the Newton Theological Institution for work done in this department, see the Catalogue, page 173.

† On leave of absence during the academic year 1912–13.

[9, 10. *Elementary Arabic*]

Grammar; exercises in writing Arabic; translation of prose selections.

Two hours. Through the year. Elective for Seniors and Graduates. Not offered in 1912–13.

[11, 12. *Gospels and Epistles*]

First semester, the Gospel and Epistles of John, the Gospel of Mark. Second semester, the Gospels of Matthew and Luke.

Not offered in 1912–13.

13, 14. *Acts and Pauline Epistles*

Characteristics of Hellenistic Greek; translation, and investigation of date, authorship, and thought. First semester, Acts and Thessalonians. Second semester, Galatians, Corinthians, and Romans. *Professor* Fowler. [This year *Professor* Cross.]

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Either semester may be elected independently. *Wed., Fri., Sat., at 11.20.*

LITERATURE AND HISTORY IN ENGLISH ‡

15, 16. *Old Testament Literature and History*

Includes nearly the entire Old Testament literature and history. Emphasis placed upon the connection between the literature and the history. In connection with course 17, 18, gives a comprehensive view of Biblical literature and history. The books are read in the best English translations. First semester, early Semitic history, Hebrew literature and history to the close of the United Kingdom. Second semester, Hebrew and Jewish literature and history from the division of the kingdom to the conquest of Alexander. *Professor* Fowler. [This year *Professor* Cross.]

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. *Mon., Wed., Th., at 10.20.*

[17, 18. *New Testament Literature and History*]

Includes a large part of the Jewish writings from the conquest of

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‡ Course 19, 20 gives a rapid survey of the Bible as a part of the world's literature. It is designed especially for those who do not expect to pursue further courses in this department. Courses 15, 16 and 17, 18 are introductory to more detailed courses in the University or the Theological Seminary. They are also designed for those who, without intending to specialize in this field, desire a comprehensive view of the nature and results of the historical as well as the literary study of the Bible.

Alexander to the destruction of Jerusalem, and the entire New Testament, studied in its Jewish setting. In connection with course 15, 16, gives a comprehensive view of Biblical literature and history. The books are read in the best English translations. First semester, Jewish literature and history from the beginning of the Greek period to the destruction of Jerusalem, the Gospels and other sources for the life of Christ. Second semester, outline of the life of Christ, literature and history of the Apostolic age.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. Not offered in 1912-13.

[19, 20. *The English Bible as Literature*]

An outline of the literary history of the Old and New Testaments; the literary forms represented in the Bible; the place of the Bible in English literature. Emphasis upon the literature itself and its connection with the present. Lectures and assigned readings from the English Bible. First semester, Old Testament literature from the beginning to the close of the Babylonian exile. Second semester, the completion of the Old Testament, and the New Testament literature.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. Not offered in 1912-13.

21,* 22.* *Biblical Seminary*

Subject for 1912-13: The development of Hebrew Social Institutions. A sociological study of Hebrew history with special reference to the family, economic institutions, the state, and religion. *Professor* FOWLER. [This year *Professor* CROSS.]

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors who have taken courses in Biblical Literature and History or in Social Science.

23. *Principles of Historical Criticism and Research*

The general principles of historical criticism and the literature of historical theory. *Professor* FOWLER. [This year *Professor* CROSS.]

One hour. One semester. Elective for Graduates of one year's standing. Required of all candidates for the degree of Doctor of Philosophy in Biblical Literature and History.

IV. BIOLOGY

Albert Davis Mead, Ph.D., Sc.D., *Professor of Biology*
Frederic Poole Gorham, A.M., *Associate Professor of Biology*
Herbert Eugene Walter, Ph.D., *Assistant Professor of Biology*
Philip Henry Mitchell, Ph.D., *Assistant Professor of Physiology*
John Burnham Ferguson, A.B., M.D., *Demonstrator in Anatomy*

1, 2. *General Biology*

The structure of animals and plants; elementary vital phenomena; the functions of organs; the development of organisms; classification. An outline of the more important biological theories, such as evolution, natural selection, variation, mutation and heredity, and the principles upon which modern hygiene and sanitation are based. The course will introduce the student to the use of the microscope, laboratory technic, and to scientific methods of observation and experiment. *Professor* Gorham.

Three hours. Six hours of attendance. Through the year. Required in Freshman or Sophomore year of candidates for the degree of Bachelor of Philosophy beginning with the class entering in 1911. Elective for Undergraduates. Lectures, *Mon., Tu., Th., at 3.20.* Laboratory, *1st div., Mon., Tu., Th., at 2.20; 2d div., Tu., Th., Sat., at 12.20.*

3, 4. *Comparative Anatomy of Vertebrates*

Intended not only for the general student, but also for those who are particularly interested in zoölogy and for those who expect to study medicine. The structure and significance of the various organs of vertebrates with particular reference to man. Students are permitted to attend clinics and autopsies at the Rhode Island Hospital. Laboratory work and lectures. *Professor* Walter.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1, 2. *Mon., Wed., Fri., at 8.*

5, 6. *Anatomy of the Nervous System*

A study of the gross and microscopic anatomy of the brain, nerves, and sense organs in man and other vertebrates. Designed particularly for those intending to study medicine or psychology. *Professor* Mead.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2.

7, 8. *Embryology and Histology*

The origin and the development of the individual body; the elementary structure of the adult organs. Practice in micro-technic. Adapted to the requirements of general students and of those intending to study medicine. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2. *Tu., Th., Sat., at 8.*

9, 10. *Advanced Histology and Pathology*

Advanced work in micro-technic and in normal and pathological histology. Adapted to individual requirements. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 1, 2, and 7, 8.

11, 12. *General Physiology*

General vital processes in plants and animals; the more special phenomena in higher animals, with their application to human physiology. Designed not only as an introduction to further work, but also as a general view of physiology. Lectures and laboratory work. *Professor* MITCHELL.

Three hours. Six hours of attendance. Through the year. Must be preceded by 1, 2, and by Chemistry 1, 2. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon., Tu., Th., at 3.20.*

13, 14. *Chemical Physiology*

The chemistry of proteins, carbohydrates, and fats; the physiology of the digestive system, with the study of secretions and of artificial salivary, gastric, and pancreatic digestions; examination of blood, bile, and urine; the analysis of foods, with special reference to milk. Designed for those who are interested in physiology either from a medical or a general standpoint, and for those who are specializing in chemistry and desire a knowledge of vital chemical processes. *Professor* MITCHELL.

Three hours. Six hours of attendance. Through the year. Must be preceded by Chemistry 1, 2, and 15. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Tu., Fri., Sat., at 10.20.*

16. *Bacteriology*

A general discussion of bacteria in all their relations, with special attention in the laboratory to the methods of studying bacteria, including the isolation, systematic study, and determination of unknown species. Lectures and laboratory work. *Professor* GORHAM.

Three hours. Six hours of attendance. Second semester. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon., Wed., Th., at 10.20.*

17, 18. *Advanced Bacteriology*

Practical work in the preparation of culture media; methods of sterilization and disinfection; qualitative and quantitative biological examination of water, milk, air, soil, and sewage; study of certain pathogenic organisms, with the determination of their pathogenic properties, and the methods of bacteriological diagnosis of disease. Laboratory work and seminary. *Professor* GORHAM.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 16.

19. *Invertebrate Zoölogy*

A study of the natural history of invertebrate animals, particularly marine forms, insects, and protozoa. Field work will constitute an important part of the course. *Professors* GORHAM *and* WALTER.

One hour. Two hours of attendance. First semester. Elective for Undergraduates. *Wed. at 2.20.*

20. *Ornithology*

A study of birds regarded as a group of living animals, in relation to their environment. Lectures and early morning field trips for the identification of wild birds during their spring migration. *Professor* WALTER.

One hour. Two hours of attendance. Second semester. Elective for Undergraduates.

[22. *Evolution*]

The history of biology, principles of classification, geographical distribution, heredity, natural selection, variation, Mendelism, and the relationship of man to the lower animals. Designed particularly for those who have not studied biology. Lectures and assigned reading.

Three hours. Second semester. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.* Not offered in 1912–13.

24. *Physiology*

A general survey of the activities of living organisms with special reference to the human body, including some applications of modern physiology to healthful living. Lectures and assigned reading. *Professor* MITCHELL.

Three hours. Second semester. Elective for Juniors and Seniors. *Tu., Th., Sat., at 8.*

31, 32. *Human Anatomy*

A course in practical dissection. Students are permitted to attend clinics and autopsies at the Rhode Island Hospital. *Dr.* FERGUSON.

Three hours. Through the year. Elective for Graduates.

33, 34. *Biological Research*

Research work arranged to meet the requirements of individual students. *Professor* MEAD.

Three to twelve hours. Through the year. Elective for Graduates.

35, 36. *Advanced Physiology*

Laboratory work and seminary. *Professor* MITCHELL.

Three to twelve hours. Through the year. Elective for Graduates who have sufficient knowledge of chemistry and physiology.

37, 38. *Bacteriological Research*

Research work arranged to meet the requirements of individual students. *Professor* GORHAM.

Three to twelve hours. Through the year. Elective for Graduates who have credit for 16 and 17, 18.

39, 40. *Biological Theories and Problems*

Seminary course. *Professor* MEAD.

One to three hours. Through the year. Elective for Graduates.

41, 42. *Zoölogical Seminary*

Reading and discussion of German zoölogical literature selected with reference to the needs of individual students. *Professor* WALTER.

One to three hours. Through the year. Elective for Graduates.

V. BOTANY

HARLAN HARVEY YORK, PH.D., *Assistant Professor of Botany*

1, 2. *General Course*

Designed not only as a general culture course, giving the student a definite conception of the vital importance of botany as related to modern life, but also as a preliminary training for those who contemplate further work in botany. The origin, development, structure, physiology, and classification of plants. A discussion of biological subjects of fundamental human interest, such as evolution, the origin of new species, and the general laws of inheritance in plants.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. Lectures, *Mon.*, *Wed.*, *at 8.* Laboratory, *Mon.*, *Tu.*, *2.20 to 4.20.*

3, 4. *Physiological Anatomy*

Intended for students who are planning to study medicine, agriculture, forestry, or plant pathology, as well as for those who expect to teach or pursue further work in botany. The origin, minute structure, and physiological function of plant tissues; reproduction, cytology, methods in microtechnic. The biological purpose of this course is to help the student to understand how plants, by the differentiation of cells and their association into tissues adapted to perform different kinds of work, are able to meet the conditions of their environment.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2, or its equivalent.

[5, 6. *Comparative Morphology and Phylogeny*]

Designed not only for the general student, but for those who expect to teach, and for those who are particularly interested in botany. Methods in microtechnic. Intended to acquaint the student with a wider range of scientific methods in plant biology through a more comprehensive knowledge of plant forms and the more fundamental conclusions of morphology and phylogeny. Special emphasis will be placed upon the evolution, morphology, and classification of plants.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2, or its equivalent. Not offered in 1912–13.

7, 8. *Advanced Course*

Special work on various phases of botany arranged to meet the requirements of individual students. May be taken in successive years. Students electing this course must plan it definitely, in consultation with the instructor, before June 1 of the preceding academic year.

One or more hours. Through the year. Either semester may be elected independently. Elective for Graduates, and for approved Juniors and Seniors.

10. *Trees*

Intended to familiarize the student with the common native and introduced trees of Rhode Island. Special attention will be given to their structure and economic value. Lectures and field work.

One hour. Two hours of attendance. Elective for undergraduates. Lectures, *Fri. at 8.*

11, 12. *Physiology*

Includes a study of imbibition, diffusion, osmosis, turgor, and the retention of bodily form; relation of soil and solutes to the plant; transpiration and exudation; movement of materials within the plant body; photosynthesis; respiration; growth and movement; reproduction and death.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2, and 3, 4, or 5, 6, and for Graduates.

VI. CHEMISTRY

John Howard Appleton, A.M., Sc.D., *Newport-Rogers Professor of Chemistry*

John Emery Bucher, Ph.D., *Associate Professor of Organic Chemistry*

Norman Edward Holt, Sc.M., *Instructor in Chemistry*

Robert Gamble Caswell, Ph.B., *Instructor in Chemistry*

Robert Foster Chambers, Sc.M., *Assistant in Chemistry*

1, 2. *Descriptive Chemistry* ‡

Non-metals; metals, their metallurgy, compounds, and practical applications; theoretical chemistry. Lectures with experiments; written exercises; individual laboratory work. *Professor* Bucher, *Messrs.* Holt *and* Chambers.

Three hours. Through the year. Elective for Undergraduates. *1st div., Mon., Th., at 10.20; 2d div., Tu., Fri., at 10.20.* Laboratory hours to be arranged with the instructor.

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‡ Credit for the entrance requirement in Chemistry admits only to 1, 2, which may be taken also without previous preparation. Students who wish to enter more advanced courses without taking 1, 2 must pass a special test at the time of the entrance examination in Chemistry. This test will cover the following topics: 1. All of the non-metals with their principal compounds and the processes of manufacture of the chief commercial products from non-metals. 2. About thirty important metals, their occurrence, preparation from the ore, the preparation and uses of their chief compounds. 3. The general principles of chemical action which depend upon physical laws. 4. Methods of making chemical computations of moderate difficulty. Preparation for this test may require the equivalent of six hours a week for one school year.

3, 4. *Qualitative and Quantitative Analysis*

Properties of the metallic elements; their separation from certain of their compounds. The principal non-metals and the acids formed by them; methods of separation and recognition of acids and acid radicles. Quantitative precipitations and separations of the most important elements and compounds; the principles upon which quantitative apparatus is constructed. Laboratory work; recitations in qualitative analysis and in chemical philosophy; exercises in stoichiometry. *Professor* APPLETON *and Mr.* CASWELL.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2. *1st div., Fri. at 11.20; 2d div., Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

5, 6. *Quantitative Analysis, Advanced Course*

Assaying of metallic ores; analysis of agricultural materials; testing of chemicals used in textile establishments, etc. *Professor* APPLETON *and Mr.* CASWELL.

Six hours. Twelve hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3, 4. Laboratory hours to be arranged with the instructor.

7, 8. *Organic Chemistry*

Preparation and analysis of representative organic compounds. Lectures, recitations, and laboratory work. *Professor* BUCHER *and Mr.* HOLT.

Six hours. Through the year. Elective for approved Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

10. *Assaying*

Professor APPLETON *and Mr.* CASWELL.

Six hours. Twelve hours of attendance. Second semester. Elective for Seniors and Graduates who have credit for 1-4.

12. *Organic Dyes*

The chemistry and use of mordants, dyes, etc. *Professor* APPLETON *and Mr.* CASWELL.

Six hours. Twelve hours of attendance. Second semester. Elective for approved Seniors and Graduates.

13, 14. *Industrial Chemistry*

Lectures and laboratory work. *Professor* APPLETON.

Three to six hours. Six to twelve hours of attendance. Through the year. Elective for approved Graduates. Either semester may be elected independently.

[15, 16. *Physical Chemistry*]

Lectures and laboratory work.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates. Not offered in 1912–13.

17, 18. *Physical Chemistry, Advanced Course*

Lectures and laboratory work. *Professor* Bucher.

Three hours. Through the year. Elective for approved Graduates who have credit for Physics 1-4, and have credit for or are taking Mathematics 7, 8.

19. *Organic Chemistry, Advanced Course*

Professor Bucher.

Three hours. First semester. Elective for approved Graduates.

20. *Inorganic Chemistry, Advanced Course*

Professor Bucher.

Three hours. Second semester. Elective for approved Juniors, Seniors, and Graduates.

21, 22. *Organic Preparations, Advanced Course*

Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

23, 24. *Inorganic Preparations, Advanced Course*

Professor Bucher.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 7, 8.

25, 26. *Research Work in Chemistry*

Professor Bucher.

Three or more hours. Through the year. Elective for Graduates.

27, 28. *Conference on Special Topics in Chemistry*

Professor Bucher.

One hour. Through the year. Elective for approved students.

29, 30. *Conference on Special Topics in Chemistry*

Professor Appleton.

One hour. Through the year. Elective for approved students.

31, 32. *Industrial Chemistry and Research*
Professor Appleton.

Three or more hours. Through the year. Elective for approved Graduates.

VII. CIVIL ENGINEERING‡

John Edward Hill, C.E.M., Sc.D., *Professor of Civil Engineering*
Hardy Cross, Sc.B., C.E.M., *Assistant Professor of Civil Engineering*
Roland Ellis Hutchins, Sc.B., *Instructor in Civil Engineering*
John Joseph Long, Ph.B., *Instructor in Civil Engineering*

1, 2. *Surveying*

Theory and practice of plane surveying; use of tape, compass, level, and transit; adjustment of instruments; pen topography; contour drawing; conventional signs; plotting. *Professor* Hill, *Messrs.* Hutchins *and* Long.

Five hours and three hours. Through the year. Elective for students who have credit for Mathematics 18 and Mechanical Drawing 2. First semester, *Mon., Tu., Th., at 11.20; Mon., Th., 2 to 5.* Second semester, *Mon. at 11.20; Mon., Th., 2 to 5.*

4. *Surveying, Advanced Field Work*

Use of stadia, plane table, and barometer; precise base-line measurement with steel tape; triangulation; topography. *Professors* Hill *and* Cross, *Messrs.* Hutchins *and* Long.

One hour. Spring recess. Elective for students who have credit for 1 and are taking 2.

6, 7, 8, 9. *Railroad Engineering*

Theory, location, construction, and economics of railroad engineering. Lectures, recitations, field work, and drafting. Second semester, railroad curves and practical problems. First semester, actual location of a line about two miles long, map, and estimate of cost. Second semester, railroad track and track work; maintenance of way department; economics of location. First semester, earthwork and its cost; rock excavation; tunneling. *Professor* Hill *and Mr.* Hutchins.

Two, three (six hours of field work), two, and two hours. Second, first, second, and first semesters. Courses 6 and 7 are elective for students who have credit for 2. Courses 8 and 9 are elective for Juniors and Seniors. Second semester,

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‡ All courses in this department are required for the degree of Bachelor of Science in Civil Engineering.

Tu., Th., at 11.20. First semester, *Wed., 9.20 to 5.* Second semester, *Tu.,Th., at 9.20.* First semester, *Fri. at 9.20; Mon., 2.20 to 5.20.*

10. *Geodesy*

Problems in geodetic surveying, with sufficient theory for a proper understanding of the formulas used. Lectures, recitations, and computations. *Professor* HILL.

Two hours. One hour of recitation and two hours of computations. Second semester. Elective for students who have credit for 4, and Astronomy 5. *Mon. at 9.20; Tu., 2.20 to 4.20.*

12. *Highway Engineering*

Economics and location of country roads; surveys, grades, drainage, and foundations; construction and maintenance; economics and design of pavements; dust prevention and preservation of macadam roads; use of bituminous materials in the construction and maintenance of roads; methods of testing road materials; roads and pavements in foreign countries; systems of administration and maintenance; highway laws. Lectures, recitations, inspection trips, and seminary work. *Mr.* HUTCHINS.

Three hours. Second semester. Elective for Sophomores, Juniors, and Seniors. *Mon., Tu., Th., at 8.*

13. *Hydraulic Engineering* ‡

Consideration of water supply mainly from a sanitary standpoint. A general course designed to give the chemical and biological aspects of water supply without laboratory work. Lectures, recitations, and seminary work. *Professor* HILL.

Two hours. First semester. Elective for Juniors and Seniors. *Mon., Th., at 10.20.*

15. *Theory of Structures*

Theory of statically determinate structures, as illustrated by the plate girder and bridge and roof trusses. Assumptions necessary in the more common cases of statical indetermination. Elements of the elastic theory of structures and applications. Analytical and graphical methods. The object is to develop accuracy in the application of the principles of mechanics to the practical problems of structural design and to establish a correct idea of the interrelation of theoretical investigations and practical details. Lectures, recitations, computations. *Professor* CROSS, *Messrs.* HUTCHINS *and* LONG.

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‡ Courses 13, 30, and 32 cover the general subject of sanitation.

Five hours. First semester. Elective for students who have credit for Mechanics 2. *Tu., Wed., Th., at 8; Tu., Wed., at 9.20.*

19. *Bridge Design*

Complete design and shop details of a through plate girder railway bridge or similar structure, accompanied by lectures and discussions. Individual data are given, business-like methods are required, and a practical attitude towards the work is encouraged. Lectures, computations, drafting. *Professor* Cross, *Messrs.* Hutchins *and* Long.

Three hours. One hour of recitation and four hours of drafting, or six hours of drafting. First semester. Elective for students who have credit for Mechanical Drawing 4, and have credit for or are taking 15. *Tu., 11.20 to 1.20; 2.20 to 6.20.*

20. *Bridge Design*

Theory and practice of truss detailing. General and working drawings are prepared for a pin or riveted truss bridge for highway or railway traffic and for a timber or steel roof truss, the work being adapted to the needs of the class. Erection, shop practice, specifications, and other points not covered in 15 are discussed. Lectures, computations, drafting. *Professor* Cross, *Messrs.* Hutchins *and* Long.

Three hours. One hour of recitation and four hours of drafting, or six hours of drafting. Second semester. Elective for students who have credit for 15 and 19. *Tu., 11.20 to 1.20; 2.20 to 6.20.*

22. *Masonry Design*

Theory of dams, arches, retaining walls, and similar structures. Special attention given to the theory of reinforced concrete. Properties of concrete. Design of a dam, an arch, and of several reinforced concrete structures. Lectures, recitations, computations, drafting. *Professor* Cross, *Messrs.* Hutchins *and* Long.

Five hours. Two hours of recitation and six hours of drafting. Second semester. Elective for students who have credit for 15, and Mechanical Drawing 4. *Mon. at 10.20; Th., 10.20 to 1.20; 2.20 to 6.20.*

24. *Foundations*

Methods employed and results to be expected in foundation work. Special attention given to the more common cases. Lectures and recitations. *Professor* Cross.

One hour. Second semester. Elective for students who have credit for Mechanics 2. *Mon. at 9.20.*

26. *Contracts and Specifications*

Law of contracts. Practical considerations in contracting. Preparation of specifications. Interpretation of contracts. Lectures and recitations. *Professor* Cross.

One hour. Second semester. Required of all candidates for the degree of Bachelor of Science. *Th. at 9.20.*

28. *Engineering Jurisprudence*

The legal and some of the economic problems involved in engineering work. The object is to emphasize the importance of these considerations in the solution of technical problems and to interest the student in further investigation. Lectures and recitations. *Professor* Cross.

One hour. Second semester. Elective for Juniors and Seniors. *Tu. at 9.20.*

30. *Hydraulic Engineering* ‡

Consideration of water supply mainly from an engineering standpoint. Irrigation, pumps and pumping machinery; construction of dams and reservoirs. Lectures, recitations, and seminary work. Supplements Mechanics 3, which gives the theoretical treatment of the subject. *Professor* Hill.

Two hours. Second semester. Elective for students who have credit for Mechanics 3. *Tu., Fri., at 10.20.*

32. *Sanitary Engineering* ‡

Theory of sewerage, treatment and disposal of sewage; stream pollution; house drainage and its appliances; garbage collection and disposal; design of sanitary works. Lectures, recitations, drafting, and seminary work. *Professor* Hill.

Three hours. Second semester. Elective for students who have credit for Mechanics 3. *Wed., Fri., at 9.20; Mon., 2.20 to 5.20.*

34. *Hydraulic Surveying* (*applied Hydraulics*)

Methods of surveying applicable to river and harbor work. Methods of measuring and rating the flow of streams. Actual measurement of the discharge of a stream by means of the current meter, weir, and floats. Recitations and field work. *Mr.* Hutchins.

One hour. Three hours of recitation or eight hours of field work last third of second semester. Elective for students who have credit for 2 and Mechanics 3. *Mon., Wed., Fri., at 11.20; or Tu., 9.20 to 5.20.*

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‡ Courses 13, 30, and 32 cover the general subject of sanitation.

35, 36. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Civil Engineering. The thesis must embody either a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

VIII. ECONOMICS ‡

Henry Brayton Gardner, Ph.D., *Professor of Economics*
James Marvin Motley, Ph.D., *Associate Professor of Economics*

1. *Elementary Economics*

Affords an outline and discussion of the fundamental principles of the subject. *Professors* Gardner *and* Motley.

Three hours. In connection with Social and Political Science 1 constitutes a year course required in Sophomore, Junior, or Senior year of candidates for the degree of Bachelor of Arts, and in Sophomore year of candidates for the degree of Bachelor of Science. Elective for others. Beginning with the class entering in 1911, required in Sophomore, Junior, or Senior year, of candidates for the degree of Bachelor of Philosophy. The combined courses will be given in two divisions. For the first division Economics will precede Social and Political Science; for the second, the order will be reversed. *1st div., first semester, Tu., Fri., Sat., at 10.20; 2d div., second semester, Mon., Wed., Fri., at 12.20.*

[5, 6. *Money and Banking*]

Principles of money; recent monetary history, particularly of the United States; systems of the leading industrial nations; present problems. Principles of banking; recent banking history, particularly of the United States; systems of the leading industrial nations; present problems, with special reference to the problem of the reform of the banking system in the United States.

Three hours. Through the year. Not offered in 1912–13. To be offered in 1913–14.

7. *Socialism and Labor Problems*

A brief review of the historically important socialistic schemes; an analysis and criticism of the leading socialistic theories, with special emphasis upon present day proposals; the rise of the trade union and the influence of collective bargaining; labor problems in the United States. *Professor* MOTLEY.

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‡ The courses in this department other than 1 are open only to those students who have credit for Economics 1, and Social and Political Science 1.

Three hours. First semester. *Mon., Tu., Th., at 11.20.*

10. *Tariff, Reciprocity, and Shipping Subsidies*

The development of the American system of protection and its effect upon domestic industry and international commerce; an analysis and criticism of arguments for protective tariff and for free trade; reciprocity agreements; policies of leading nations with regard to state aid to shipping. *Professor* MOTLEY.

Three hours. Second semester. *Mon., Tu., Th., at 11.20.*

11, 12. *Public Finance and Financial History*

General principles of public finance; revenues and expenditures of leading industrial nations; public enterprises in their financial aspects; principal forms of taxation and their effects; public debts. Special attention will be given to the financial history of the United States from the adoption of the Constitution to the present day. *Professor* GARDNER.

Three hours. Through the year. *Wed., Fri., Sat., at 11.20.*

13. *Statistics*

The principles of statistics as a method of recording and presenting social and economic facts; the possibilities and limitations of the statistical method; the interpretation of statistics; some of the important results of statistical investigation. *Professor* GARDNER.

Three hours. First semester. *Tu., Th., Sat., at 12.20.*

14. *Accounting*

The importance of accounting in economic life and the principles which underlie it; the accounting systems of public bodies and quasi-public corporations; the interpretation of financial statements. *Professor* GARDNER.

Three hours. Second semester. *Tu., Th., Sat., at 12.20.*

15. *Trade and Transportation*

The organization of international trade and the place of the United States in the commerce of the world; a description of the existing trade relations of the United States, of the conditions which control them, and the probable lines of their development, the organization and development of the internal trade of the United States with special reference to railway transportation and the problems to which it has given rise. *Professor* MOTLEY.

Three hours. First semester. *Mon., Wed., Th., at 10.20.*

16. *Corporations and Corporation Finance*

The corporation as a form of business organization; its formation and promotion; capitalization; forms of securities; the stock market; state and federal control and similar topics. *Professor* MOTLEY.

Three hours. Second semester. *Mon., Wed., Th., at 10.20.*

21, 22. *Investigation of Special Topics*

Intended to afford a training in methods of gathering, handling, and presenting data in the study of economic life and problems. Each student is assigned a separate topic. *Professor* GARDNER.

Three hours. Six hours of attendance. Through the year. Either semester may be elected independently. Students intending to take either of these courses must secure the permission of the head of the department not later than December 1 or June 1 in the semester preceding that in which they desire to take the course. It is expected that as a rule these courses will be taken in connection with lecture courses. Hours to be arranged with the instructor.

23, 24. *Economic Seminary*

Study of important aspects of economic theory, history, and current problems of economic life. The first semester, 1912-13, will be devoted to a study of questions connected with the economic history of the United States. *Professors* GARDNER *and* MOTLEY.

Three hours. Two hours of attendance. Through the year. Elective for Seniors and Graduates who have taken advanced work in Economics. Hours to be arranged with the instructor.

IX. EDUCATION ‡

Walter Ballou Jacobs, A.M., *Professor of the Theory and Practice of Education*

1. *History of Education*

Education among the early culture peoples; development of education in Greece and Rome; early Christian education; the Renaissance and humanism; the beginnings of modern education; the naturalistic movement, Rousseau; the psychological movement, Pestalozzi, Froebel, Herbart; the scientific movement, Spencer and Huxley; recent sociological tendencies; the American college; the movement for industrial education.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates, and by permission. *Mon., Wed., Fri., at 12.20.*

2. *Principles of Education*

The meaning and aim of education; its function as a social institution; physical education—heredity, growth, and development; intellectual education—its aim, the choice of studies, their organization into a consistent whole; the principles of method in teaching; moral education. Education as limited by environment and as gaining the mastery over environment.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates, and by permission. *Mon., Wed., Fri., at 12.20.*

3. *The Process of Education; its Psychology and Hygiene*

Theory and process of mental and physical development with special emphasis upon the period of adolescence. Educational psychology; mind as developing out of the control of instincts; the learning process; imitation and suggestion as factors in education; the psychology of the various studies and disciplines; the theory of formal discipline. The hygiene of body and mind; play and fatigue, physical culture and athletics; arrested growth in body and mind, its causes and its prevention.

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‡ Courses 1 and 2 treat education in its relation to the individual and to the social and political whole; interest in them is therefore not limited to those who intend to teach. At the same time they form an introduction to the more advanced courses in Education. Those who intend to teach are advised to elect these courses during the Junior year.

Courses 1-4 cover the usual requirements for certificates of the First Grade except where practice teaching or experience is demanded. In Rhode Island a certificate is required of all teachers in schools supported in whole or in part by public money. Certificates of the First Grade are granted without examination to those who have completed courses 1-4 and hold a college degree. Due credit is also given for separate courses.

Certificates, authorizing the holders to teach in the evening schools of the state, are issued without examination to students who have completed three years of regular work, including Education 1, 2.

Three hours. First semester. Elective for students who have credit for 1 or 2, or who are taking 1, and for Graduates. *Mon., Tu., Th., at 11.20.*

4. *Practical Introduction to Teaching*

The elements of method and their application in practice teaching; observation of good teaching; management and discipline of classes; administration of education; school buildings, their proper construction, maintenance, and equipment; medical inspection; school law.

Three hours. Second semester. Elective for students who have credit for or are taking other courses in Education, and for Graduates. *Mon., Tu., Th., at 11.20.*

5. *Secondary Education; Organization and Function*‡

The place of the high school and academy in the American system of education; comparison with secondary schools in Germany, France, and England; the administration of secondary education; its relation to the colleges and universities; meaning and value of the various secondary school studies, and their organization into a curriculum; high schools; the social life of the high school and academy; high school extension.

Three hours. Two hours of class-room attendance. First semester. Required of student-teachers. Elective for Graduates and experienced teachers, and for approved Seniors. *Wed., 3.20 to 5.20.*

6. *Secondary Education; Methods and Processes*‡

The principles of method as applied to teaching in secondary schools; the resources at the command of the teacher; the preparation of teachers. The following will receive special attention as typical secondary school studies: English, Modern Languages and Latin; History, Science, and Mathematics; the Manual Arts.

Three hours. Two hours of class-room attendance. Second semester. Required of student-teachers. Elective for Graduates and experienced teachers, and for approved Seniors. *Wed., 3.20 to 5.20.*

7, 8. *Problems in Practical Teaching; Secondary Schools*‡

Practice teaching in the Providence High Schools. Observation, reports, and conferences. Designed for those who wish to become instructors in colleges, teachers or principals in secondary schools, or superintendents of schools.

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‡ In connection with this course, and for an explanation of the work of student-teachers, see the Catalogue, page 174.

Three hours. Through the year. Elective for Graduates who have credit for elementary courses in Education and are taking 5 and 6; also for approved Seniors. *Fri. at 3.20*, and at other hours to be arranged.

9, 10. *Problems in Practical Teaching; Grammar Grades*‡

Practice teaching in the Providence Grammar Schools. Observation, reports, and conferences. Designed especially for those who wish to become grade teachers, principals of grammar schools, or superintendents of schools, but also for those who wish to teach in secondary schools. The following studies receive special attention: Arithmetic, Language, History, and Geography.

Three hours. Through the year. Elective for Graduates who have credit for elementary courses in Education and are taking 11, 12; also for approved Seniors. *Mon. at 3.20*, and at other hours to be arranged.

11, 12. *Seminary in Education*‡

Studies in current educational problems. The seminary will be conducted in two parts in successive hours. *Part A.* Reviews of the latest books upon education and related subjects, and studies of special topics assigned for presentation. *Part B.* A more intensive study of certain problems of current interest. For 1912–13 the subjects will be: First semester, Social Phases of Education. Second semester, Administrative Phases of Education. As subjects are not repeated, the course may be elected for successive years.

Three hours. Through the year. Two hours of class-room attendance. Required of student-teachers. Elective for Graduates and experienced teachers, and for approved Seniors. A or B may be elected independently as a one-hour course. *Sat., 10.20 to 12.20.*

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‡ In connection with this course, and for an explanation of the work of student-teachers, see the Catalogue, page 174.

X. ENGLISH ‡

Walter Cochrane Bronson, A.M., Litt.D., *Professor of English Literature*

Lindsay Todd Damon,† A.B., *Professor of English Literature and Rhetoric*

Albert Knight Potter, A.M., *Associate Professor of the English Language*

George Wyllys Benedict, Ph.D., *Associate Professor of English*

Thomas Crosby, A.M., *Associate Professor of English and Public Speaking*

Henry Barrett Huntington, A.B., *Associate Professor of English*

William Thomson Hastings, A.M., *Instructor in English*

Stanley Bates Harkness, A.B., *Instructor in English*

Laurence Rich Grose, A.M., *Instructor in English*

Harry Worthington Hastings, A.M., *Instructor in English*

______________________________, *Assistant in English*

______________________________, *Assistant in English*

1. *Rhetoric and Composition*

Designed primarily to teach clear and correct expression. Training in the fundamentals of prose composition. Lectures, recitations, and themes. *Professor* Benedict, *Messrs.* W. T. Hastings, Harkness, Grose, H. W. Hastings, Henderson, *and* ——.

Three hours. First semester. Required of all Freshmen. *1st, 2d, 3d, and 4th div., Mon., Tu., Th., at 11.20; 5th, 6th, 7th, and 8th div., Mon., Wed., Fri., at 12.20; 9th div., Wed., Fri., Sat., at 11.20; 10th div., Mon., Tu., Th., at 3.20.* Candidates for the degree of Bachelor of Science will register in divisions 5 and 6.

2. *Rhetoric and Composition*

A continuation of 1. Designed primarily to give training in the method, structure, and style of the chief forms of prose composition. Lectures, recitations, and themes. *Professor* Benedict, *Messrs.* W. T. Hastings, Harkness, Grose, ——, *and* ——.

Three hours. Second semester. Required in the Freshman year of all candidates for the degree of Bachelor of Science, and in the Sophomore year of all candidates for the degree of Bachelor of Arts or Bachelor of Philosophy. Students electing 3, 4 may substitute 3 for 2. *1st, 2d, and 3d div., Mon., Wed., Fri., at 12.20; 4th div., Wed., Fri., Sat., at 11.20.* Freshman candidates for the degree of Bachelor of Science will register in Sections 1 and 2. Students repeating 1 or 2 will register in sections 3 and 4.

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‡ Credit for English 1 is a prerequisite for admission to all other courses in the department except 48.

Courses 1-16 may not be counted in fulfilment of the requirement of a year in English Literature.

† On leave of absence during the academic year 1912-13.

48. *English Literature from the Beginning to 1798*

An outline course in the history of English literature, with reading and study of the greater writers. *Professors* BRONSON *and* BENEDICT, *Messrs.* W. T. HASTINGS *and* HARKNESS.

Three hours. Second semester. Required in the Freshman year of all candidates for the degree of Bachelor of Arts or Bachelor of Philosophy. In 1912–13 elective for Sophomores. *1st, 2d, and 3d div., Mon., Tu., Th., at 11.20; 4th and 5th div., Mon., Wed., Fri., at 12.20; 6th div., Wed., Fri., Sat., at 11.20.*

3, 4. *English Composition, Second Course*

Intended to supplement the training given in 1, 2, and to develop further the power of exact and lucid statement. Lectures, recitations, and prescribed reading; weekly themes and other written exercises involving a variety of specific tasks such as abstracts, reports, scientific, technical, and historical papers, criticism, stories, the personal essay, etc. *Mr.* W. T. HASTINGS.

Three hours. Through the year. Elective for Sophomores and Juniors. Students electing 3, 4 may substitute 3 for 2. *Mon., Wed., Th., at 10.20.*

[5, 6. *English Composition, Advanced Course*]

Intended to develop ease of style and clarity and vigor of thought. Frequent practice in composition and criticism.

Three hours. Through the year. Elective for Juniors and Seniors. With the consent of the instructor the course may be repeated. Not offered in 1912–13.

7, 8. *Argumentative Composition*

Intended to develop the power of handling argumentative topics cogently and persuasively. Lectures on the principles and forms of argumentative composition; frequent practice in brief-drawing and the writing of forensics and less formal arguments. *Professor* HUNTINGTON.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors; required in the Sophomore year of candidates for the degree of Bachelor of Philosophy who did not take mathematics in their Freshman year. *Tu., Fri., Sat., at 10.20.*

9. *Argumentative Composition*

Intended to furnish a more rapid training than 7, 8 for students who wish to begin debate as early as possible or to go quickly over the fundamentals of argumentative composition. The principles and forms of brief-drawing and forensic writing. Lectures, written exercises, briefs, and forensics. *Professor* HUNTINGTON.

Three hours. Two hours of attendance. First semester. Elective for Juniors and Seniors. Not elective for students who have taken 7, 8. *Mon. at 3.20; Fri. at 2.20.* Not to be offered in 1913–14.

10. *Debate*

Intended to train students in correct and vigorous oral presentation of ideas. *Professor* HUNTINGTON, *with the coöperation of the Professors of Economics, Social and Political Science, History, and Public Speaking.*

Three hours. Second semester. Elective for a limited number of Juniors and Seniors who have credit for 9 or 7. With the consent of the instructor the course may be repeated. *Mon., 3.20 to 5.20; Fri., 2.20 to 4.20.*

11, 12. *Public Speaking*

Principles of voice culture; vocal interpretation of literature; extempore speaking. *Professor* CROSBY.

Three hours. Through the year. Elective for Sophomores and Juniors. *Wed., Fri., Sat., at 11.20.*

13, 14. *Public Speaking, Advanced Course*

Practice in reading lyric, narrative, and dramatic literature, in extempore speaking, and in the composition and delivery of the common forms of the occasional address. Special attention to securing right tone-production and to improvement in speech. *Professor* CROSBY.

Three hours. Through the year. Elective for students who have attained the grade of C in 11, 12. *Mon., Wed., Fri., at 12.20.* Not to be offered in 1913–14.

15, 16. *Old English*

Essentials of Anglo-Saxon grammar; prose selections; Beowulf. *Professor* POTTER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 4.20.*

17, 18. *Chaucer*

A study of the poems as literature, with sufficient attention to Middle

English grammar to enable the student to read intelligently. Selections from Langland and Gower. *Professor* Potter.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 3.20.*

[21, 22. *The Drama in England to 1642*]

The drama as a literary type and its history in England to the closing of the theatres.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for a year's work in English Literature. Not offered in 1912–13.

[23. *The Modern English Drama*]

The history of the English drama from 1660 to the present time. Reading and discussion of the work of the chief playwrights from Wycherley and Congreve to Jones, Pinero, and Shaw.

Three hours. First semester. Elective for Juniors and Seniors who have credit for a year's work in English Literature. Not offered in 1912–13.

[25, 26. *Shakspere*]

Careful study of a few plays with special attention to exact interpretation.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Not offered in 1912–13.

27, 28. *Shakspere*

A brief survey of the drama before Shakspere. Shakspere as playwright and poet. Reading of all the plays; careful study of the great tragedies. Lectures, discussions, and reports on assigned topics. *Professor* Potter.

Three hours. Through the year. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.20.*

[31, 32. *English Literature from 1660 to 1798*]

The Restoration drama; the classical school; development of the essay and the novel; the beginnings of romanticism.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for a year's work in English Literature. Not offered in 1912–13.

[33, 34. *The English Novel*]

The history of the English novel from 1700 to 1900; reading and discussion of the greater English novelists, including Defoe, Richardson, Fielding, and Smollett in the eighteenth century, and Scott, Jane Austen, Dickens, Thackeray, Charlotte Brontë, George Eliot, Meredith, Hardy, and Stevenson in the nineteenth century.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for Juniors and Seniors. Not offered in 1912–13.

35. *English Literature from 1798 to 1832, Poetry*

The reaction from pseudo-classicism; the influence of the French Revolution; liberalism and individualism in English poetry; contemporary criticism. Wordsworth, Coleridge, Southey, Scott, Byron, Shelley, Keats, Landor. *Professor* BENEDICT.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. First semester. Elective for Sophomores, Juniors, and Seniors. *Mon., Tu., Th., at 11.20.*

36. *English Literature from 1798 to 1832, Prose*

The development of the romantic novel; the rise of the reviews and quarterlies; essays and miscellaneous prose. Scott, Jane Austen, Coleridge, Jeffrey, De Quincey, Lamb, Hazlitt. *Professor* BENEDICT.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Second semester. Elective for Sophomores, Juniors, and Seniors. *Mon., Tu., Th., at 11.20.*

37. *English Literature from 1832 to 1892, Prose*

Modifications of romanticism; realism; the influence of science and democracy; tendencies at the end of the century. Essays, history, miscellaneous prose, the novel. Macaulay, Carlyle, Arnold, Ruskin, Pater, Newman, Huxley, Dickens, Thackeray, the Brontës, George Eliot. *Professor* BRONSON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. First semester. Elective for Sophomores, Juniors, and Seniors. *Wed., Fri., Sat., at 11.20.*

38. *English Literature from 1832 to 1892, Poetry*

Modifications of romanticism; Pre-Raphaelitism; the influence of science and democracy; tendencies at the end of the century. Tennyson, Browning, Arnold, Clough, Rossetti, Morris, Swinburne. *Professor* BRONSON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Second semester. Elective for Sophomores, Juniors, and Seniors. *Wed., Fri., Sat., at 11.20.*

[39, 40. *American Literature*]

American literature from the beginning to 1900, in its relation to American life and to English literature. A rapid survey of the literature of the seventeenth and eighteenth centuries; reading and study of the writers of the nineteenth century, with special attention to Irving, Cooper, Bryant, Poe, Longfellow, Emerson, Hawthorne, Whittier, Lowell, Holmes, and Whitman.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for a year's work in English Literature. Not offered in 1912–13.

[42. *Contemporary English and American Literature*]

A study of the tendencies of modern thought through the literature that reflects it. Reading and discussion of contemporary poets, novelists, and essayists.

Three hours. Second semester. Elective for Juniors and Seniors. Not offered in 1912–13.

43, 44. *Seminary in English Literature*

Subject for 1912–13: Studies in Milton. *Professor* BRONSON.

Three hours. Two hours of attendance. Through the year. Elective for Graduates, and for a limited number of Seniors who have attained the grade of C in two years' work in English Literature.

XI. GEOLOGY

CHARLES WILSON BROWN, A.M., *Assistant Professor of Geology*
————————————, *Instructor in Geology*

1, 2. *General Geology*

A study of the development of the earth, with special reference to the North American Continent, including a discussion of earth origin, of the work of surface and interior agencies in the production of various topographic forms, rock types and their changes, crustal deformation and continent making, together with a survey of ancient life types and the principles of organic evolution they illustrate. First semester, dynamic and structural geology. Second semester, stratigraphy and paleontology.

Three hours. Through the year. Elective for Undergraduates. *Mon., Wed., Th., at 10.20.*

3, 4. *General Geology*

A shorter course than 1, 2, with emphasis upon the discussion of problems that may arise in engineering work. Special attention in map and field study to topographic features resulting from the various geologic agencies, and to the study of hand specimens of ores, minerals, and rock types and their uses. May be continued in 8.

Two hours. Four hours of attendance. Through the year. Required in the Junior year of candidates for the degree of Bachelor of Science in Civil Engineering. Not elective. First semester, *Mon. at 10.20; Fri. at 9.20.* Second semester, *Mon., Wed., at 10.20.*

5. *Physical Geography*

Study of the origin, development, and recognition of topographic features produced by agencies such as rivers, oceans, glaciers, and vulcanism; discussion of soils, ores, and other natural resources. May be continued in 6 or 8.

Three hours. First semester. Elective for Juniors and Seniors, and for Freshmen and Sophomores who are not taking another course in the department. *Mon., Th., at 10.20.* Conference hour to be arranged with the instructor.

6. *Economic Geography and Conservation*

A discussion of the laws of meteorology, and the relation of climate to soil products and to man and his development; the physiographic controls that influence the development of transportation and commerce; agriculture, forests, water power, and water supply; the location and proper development of cities; and the geographic distribution and conservation of ore deposits and other natural resources. May be continued in 8, or 11, 12.

Three hours. Second semester. Elective for Undergraduates who have credit for 1 or 5, or who presented Physiography for admission, except Freshmen and Sophomores who are taking another course in the department. *Tu., Wed., Sat., at 9.20.*

[7. *Economic Geology*]

A discussion of the theories concerning the origin of ore deposits; the geologic relations, and the location, distribution, and production of ores.

Three hours. First semester. Elective for Undergraduates who have credit for 1, 3, or 9, 10. Not offered in 1912–13.

8. *Stratigraphy and Structural Geology*

An introductory course in field geology. Study of areal and structural geology in igneous and sedimentary areas from geologic reports. Practice in the construction of geologic maps and work in the field areas.

Three hours. Second semester. One conference hour to be arranged, and the equivalent of five hours' work in the laboratory or field. Elective for Undergraduates who have credit for 1, 3, or 5.

9, 10. *Mineralogy and Petrography*

An introductory course in the macroscopic and microscopic study of minerals, ores, and rocks. First semester, discussion of crystal forms and the laws of crystallography, determination by physical properties and blow-pipe analysis of the more common minerals and ores. Second semester, study of the optical properties of the rock-forming minerals, rocks, and ores, under the polarizing microscope; determination of rock types; discussion of the fundamental principles of the origin and classification of rocks and ores.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Th., at 11.20.*

11, 12. *Research in Geology and Geography*

Advanced work in the library, laboratory, or field, in the various phases of geology or geography as outlined in the preceding elementary courses. The region in which the University is situated offers in a small compass both simple and complex problems in field research in structural, petrographic, paleontologic, and stratigraphic geology. Arranged to meet the requirements of individual students.

One to six hours. Through the year. Elective for Graduates and approved Undergraduates. Either semester may be elected independently.

13. *The Stratigraphy and Paleontology of the Narragansett Basin*

Designed to give, by study in the library and field, a detailed knowledge of the conditions of origin, relationships, structure, and fossil content, of the different groups of the carboniferous system represented in the Narragansett Bay region.

Three hours. One hour of attendance. First semester. Elective for Juniors, Seniors, and Graduates who have credit for Geology 1, 2, and 8, or their equivalents. Not to be offered in 1913–14.

XII. GERMANIC LANGUAGES AND LITERATURES‡

Camillo von Klenze,† Ph.D., *Professor of the Germanic Languages and Literatures*

Asa Clinton Crowell, Ph.D., *Associate Professor of the Germanic Languages and Literatures*

Robert McBurney Mitchell, A.B., *Instructor in German*

John Herbert Bachmann, A.M., *Instructor in German*

Albert Edward Rand, A.B., *Instructor in German*

Bernard Keenan, A.M., *Assistant in German*

1, 2. *Elementary Course, First Year*

Reading, grammar, composition, conversation, dictation, sight reading. *Professor* Crowell, *Messrs.* Mitchell, Bachmann, *and* Rand.

Three hours. Through the year. Elective for students who did not present German for admission. *1st div., Tu., Wed., Sat., at 9.20; 2d div., Mon., Th., Fri., at 9.20; 3d div., Tu., Th., Sat., at 12.20; 4th div., Mon., Tu., Th., at 2.20.*

3, 4. *Elementary Course, Second Year*

Reading of fairly difficult modern German stories, lyrics (von Klenze or Hatfield), and two dramas illustrating respectively the classical and the modern period, for example, Schiller's *Maria Stuart* and Hebbel's *Agnes Bernauer.* Review of grammar; composition; conversation based upon the texts read. *Professor* Crowell *and Mr.* Rand.

Three hours. Through the year. Elective for students who have credit for 1, 2. *1st div., Mon., Wed., Th., at 10.20; 2d div., Tu., Wed., Sat., at 9.20.*

5, 6. *Intermediate Course*

Reading of fairly difficult modern German stories, lyrics (von Klenze or Hatfield), and one or two dramas of the classical period. Review of grammar; composition; conversation based upon the texts read. *Messrs.* Mitchell, Bachmann, *and* Rand.

Three hours. Through the year. Elective for Freshmen who presented elementary German for admission. Not elective for students who have taken German in college. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Tu., Fri., Sat., at 10.20; 3d div., Mon., Wed., Th., at 10.20.*

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‡ Students wishing recommendations from the department to teach German must pass a special examination designed to test their ability to write and to understand German, and, to some extent, to use the spoken language.

† On leave of absence during the academic year 1912–13.

7, 8. *Advanced Course in Standard Authors, Classical and Modern*

One drama of Goethe or Schiller, one drama of Grillparzer, one drama of Hebbel, von Klenze's *Deutsche Gedichte,* a modern novel like Sudermann's *Frau Sorge.* Talks in German on the history of German literature; oral and written reports in German. *Mr.* BACHMANN.

Three hours. Through the year. Elective for students who have credit for 3, 4, or 5, 6, or 9, 10; or who presented advanced German for admission. *Mon., Tu., Th., at 11.20.*

9, 10. *Modern Prose*

Aims to train the student in reading, speaking, writing, and understanding modern German. Reading of texts selected from history and science; for example, Freytag, Helmholtz, Nichols's *Modern German Prose,* Paszkowski's *Lesebuch zur Einführung in die Kenntnis Deutschlands und seines geistigen Lebens,* 4th ed., and a text (such as Mosher's *Willkommen in Deutschland*) to introduce the student to the actual language of modern daily life. Talks in German; oral and written reports in German; letter-writing, composition, and conversation. *Messrs.* MITCHELL *and* KEENAN.

Three hours. Through the year. Elective for students who have credit for 3, 4, or 5, 6, or 7, 8; or who presented advanced German for admission. *Tu., Fri., Sat., at 10.20.*

[11, 12. *German Lyrical Poetry*]

Introduces the student to the various aspects of the inner life of the German people as reflected in the lyrical poetry of the last two centuries. Lectures in German; oral and written reports in German.

Three hours. Through the year. Elective for students who have credit for 3, 4, or 7, 8, or 9, 10. Not offered in 1912–13.

13, 14. *The German Short Story*

The development of the short story into an art form. The study of the "Novelle" as represented by Kleist, Ludwig, Heyse, Storm, C. F. Meyer, Keller, and others, with frequent reference to the chief writers of the short story in France, England, and America. Lectures and reports in German and English. *Mr.* BACHMANN.

Three hours. Through the year. Elective for students who have credit for 3, 4, or 7, 8, or 9, 10. *Tu., Wed., Sat., at 9.20.*

[15, 16. *The German Drama of the Nineteenth Century*]

Kleist, Grillparzer, Hebbel, Hauptmann, and Sudermann. A study of the development of the German drama from waning romanticism to realism, with frequent reference to the chief representatives of the modern drama in other countries.

Three hours. Through the year. Elective for students who have credit for 3, 4, or 7, 8, or 9, 10. Not offered in 1912–13.

17, 18. *Lessing and Schiller*

Aims to introduce the student to the dramatic theory and practice of German classicism. Reading of one or two of Lessing's dramatic works and of several of the representative dramas of Schiller, especially *Wallenstein.* Discussions of the dramatic principles of the Greek and the English drama and of their influence upon Lessing and Schiller, with references to the dramatic theories of the nineteenth century. Lectures and reports in German and English. *Professor* CROWELL.

Three hours. Through the year. Elective for students who have credit for 7, 8, or 9, 10. *Mon., Wed., Fri., at 12.20.*

[21, 22. *Goethe's Faust: Parts* 1 *and* 2]

Interpretation of the text; study of the Faust legend and of other English and German dramas which present the Faust problem. Lectures and reports in German and English.

Three hours. Through the year. Elective for students who have credit for 7, 8, or 9, 10. Not offered in 1912–13.

[23, 24. *Goethe: A Study of His Life and Works*]

Lectures in German; reports on assigned topics; extensive reading.

Three hours. Through the year. Elective for students who have credit for 7, 8, or 9, 10. Not offered in 1912–13.

[25, 26. *Outline History of German Literature*]

Aims to acquaint the student with the most important movements in the evolution of German literary life. Lectures in German; reports on assigned topics; extensive reading.

Three hours. Through the year. Elective for students who have credit for 7, 8, or 9, 10. Not offered in 1912–13.

27, 28. *German Literature in the Nineteenth Century*

A study of the literary life of Germany as an expression of German civilization in the nineteenth century. The literary output—Romantic School, Young Germany, Naturalism, Realism, Neo-Romanticism

—will be studied, with frequent references to prominent personalities in other domains of intellectual life, such as David Friedrich Strauss, Mommsen, Nietzsche, Wagner. Lectures in German; reports on assigned topics; extensive reading. *Mr.* MITCHELL.

Three hours. Through the year. Elective for students who have credit for 7, 8, or 9, 10. *Tu., Th., Sat., at 12.20.*

31. *Gothic*

The Gothic language, with reading of extracts in Streitberg's *Gotisches Elementarbuch* or Braune's *Gotische Grammatik. Professor* CROWELL.

Three hours. First semester. Elective for Graduates and approved Undergraduates. *Wed., Fri., Sat., at 11.20.*

32. *Old High German*

Grammar and reading of selections in prose and verse. Some knowledge of Gothic expected. Braune's *Althochdeutsche Grammatik* and Braune's *Althochdeutsches Lesebuch. Professor* CROWELL.

Three hours. Second semester. Elective for Graduates and approved Undergraduates. *Wed., Fri., Sat., at 11.20.*

[33. *Old Norse*]

Holthausen's *Altisländisches Elementarbuch;* Wilken's *Prosaische Edda;* Hildebrand's *Aeltere Edda.*

Three hours. First semester. Elective for Graduates and approved Undergraduates. Students electing Old Norse should also take Germanic Mythology. Not offered in 1912–13.

[34. *Germanic Mythology*]

Primitive Germanic religion, customs, and ideas, in their relations to German literature. Discussions based on E. Mogk's *Germanische Mythologie. Professor* CROWELL.

Three hours. Second semester. Elective for Graduates and approved Undergraduates. Not offered in 1912–13.

[35, 36. *Middle High German*]

The language of the Middle High German period, including an introduction to Germanic philology. Michel's *Mittelhochdeutsches Elementarbuch; Das Nibelungenlied, Minnesangs Frühling, Walter von der Vogelweide.* Lectures in German. Outside reading.

Three hours. Through the year. Elective for Graduates and approved Undergraduates. Not offered in 1912–13.

[41, 42. *Seminary in German Literature*]

Aims to give training in modern methods of investigation and criticism. To be conducted in German.

Three hours. Through the year. Elective for Graduates and approved Undergraduates. Not offered in 1912–13.

XIII. GREEK LITERATURE AND HISTORY

JAMES IRVING MANATT, PH.D., LL.D., *Professor of Greek Literature and History*

FRANCIS GREENLEAF ALLINSON, PH.D., *David Benedict Professor of Classical Philology*

——————————, *Assistant in Greek*

A, B. *Elementary Course*

Designed to cover as much as possible of the entrance requirements, and thus to enable a student to take 1 in the following year if he completes by private study before the opening of the first semester the requirement in Homer, and before the opening of the second semester the requirement in the *Anabasis*. *Mr.* ——.

Three hours. Through the year. Elective for students who did not present elementary and advanced Greek for admission. *Tu., Th., Sat., at 12.20.*

1. *Homer and the Greek Anthology*

Six books of the *Odyssey* in the original, with a general survey of the entire poem. Selections from the Elegiac, Iambic, and Lyric Poets. *Professor* MANATT.

Three hours. First semester. Elective for students who presented elementary and advanced Greek for admission, or who have credit for A, B, and have done the additional work indicated above. *Tu., Th., Sat., at 12.20.*

2. *Plato and Lysias*

Plato: *Apology* and *Crito,* with selections from *Phaedo,* and collateral readings from the *Euthyphron,* Xenophon's *Memorabilia,* and the *Clouds* of Aristophanes. Lysias: *Orations* VII, XXII, XXIII, XXIV, with collateral reading of Xenophon's *Hellenica,* II. *Professor* ALLINSON.

Three hours. Second semester. Elective for students who have credit for 1. *Tu., Th., Sat., at 12.20.*

3. *Lucian and the Dramatic Poets*

Selections from Lucian. Lectures on the Greek drama. The *Oedipus*

Tyrannus of Sophocles and collateral reading in the *Prometheus* of Aeschylus. *Professor* ALLINSON.

Three hours. First semester. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

4. *The Historians*

The eighth book of Herodotus, with collateral reading of the *Persians* of Aeschylus and Plutarch's *Themistocles.* The seventh book of Thucydides, with collateral reading of Plutarch's *Pericles* and *Nicias. Professor* MANATT.

Three hours. Second semester. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

[5. *Epic Poetry*]

The *Iliad,* XVIII-XXIV, with a general study of the poem as a whole. Hesiod: selections from the *Theogony* and the *Works and Days.* Selected Homeric Hymns.

Three hours. First semester. Elective for Juniors and Seniors. Hours to be arranged with the instructor. Not offered in 1912–13.

[6. *The Drama*]

Menander. Aeschylus: *Seven against Thebes.* Euripides: *Medea.* Aristophanes: *Frogs.*

Three hours. Second semester. Elective for Juniors and Seniors. Hours to be arranged with the instructor. Not offered in 1912–13.

7. *Lyric and Pastoral Poetry*

Pindar: selected Olympian and Pythian Odes. Bacchylides, V, XVII, XVIII. Theocritus: twelve *Idylls. Professor* MANATT.

Three hours. First semester. Elective for Juniors and Seniors.

8. *Plato, Aristotle, and Aeschylus*

Plato: selections from the *Republic.* Aristotle: the *Constitution of Athens.* Aeschylus: the *Agamemnon,* with collateral reading of the rest of the *Oresteia. Professor* ALLINSON.

Three hours. Second semester. Elective for Juniors and Seniors.

[9. *The Attic Orators*]

Selected speeches of Isaeus, Aeschines, and Demosthenes.

Three hours. First semester. Elective for Juniors and Seniors. Not offered in 1912–13.

[10. *Lucian and Pausanias*]

Three hours. Second semester. Elective for Juniors and Seniors. Not offered in 1912–13.

12. *Greek Composition*

Professor ALLINSON.

One hour. Second semester. Elective for Sophomores, Juniors, and Seniors.

13, 14. *Modern Greek*

Introduction to the language; readings from living Greek authors and Greek newspapers; conversation. *Professor* MANATT.

One hour. Through the year. Elective for Sophomores, Juniors, and Seniors.

15. *Greek Civilization*

The life of the Greeks from Homer to the second century after Christ, with special study of the political, social, and religious institutions of the classical period as illustrated by the literature, history, and monuments of art. Must be followed in the second semester by Latin 16, Roman Civilization. The two semesters together constitute the course in Classical Civilization. *Professor* ALLINSON.

Three hours. First semester. Required in the Freshman or Sophomore year of all candidates for the degree of Bachelor of Philosophy. Not elective. *1st div., Mon., Th., Fri., at 9.20; 2d div., Mon., Tu., Th., at 11.20.*

17, 18. *Greek Seminary*

First semester, Aristotle's *Politics. Professor* MANATT. Second semester, Aristophanes and the Comic Fragments. *Professor* ALLINSON.

Three hours. Two hours of attendance. Through the year. Elective for Graduates and approved Seniors.

XIV. HISTORY ‡

WILLIAM MACDONALD, PH.D., LL.D., *George L. Littlefield Professor of American History*

THEODORE FRELINGHUYSEN COLLIER, PH.D., *Associate Professor of History*

1, 2. *Medieval and Modern History of Europe*

A general survey of the history of western Europe from the time of the barbarian invasions to the present. A narrative text-book supplemented by lectures, frequent written tests, written reports and abstracts on assigned reading, and topics for special investigation. *Professor* MacDonald.

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‡ The elective courses in History are regularly open only to students who have credit for 1, 2, but by special permission of the instructor elective courses may be taken by students who are at the same time taking 1, 2.

Three hours. Through the year. Required of candidates for the degree of Bachelor of Arts in the Sophomore or Junior year, and of candidates for the degree of Bachelor of Philosophy in the Freshman, Sophomore, or Junior year. *Mon., Tu., Th., at 2.20.*

3. *Early and Medieval Christianity*

A study of the development of Christian thought and institutions from the Apostolic age to the Reformation, with emphasis upon the internal life of the Church rather than upon its external political relations. *Professor* Collier.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. Introductory to 4. *Tu., Th., Sat., at 12.20.*

4. *The Reformation*

The Church on the eve of the Reformation; the Lutheran revolt; Calvinism; the Church of England; Counter-reformation and religious wars; the Thirty Years' war; the Puritan Revolution in England; and the parallel study of the development of Protestant doctrine. *Professor* Collier.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. A continuation of 3, by which it should preferably be preceded. *Tu., Th., Sat., at 12.20.*

5. *The French Revolution and the Napoleonic Era*

A brief preliminary survey of the international political developments of the eighteenth century, followed by a more detailed study of the causes of the French Revolution, the Revolution, and the rise and overthrow of Napoleon. *Professor* Collier.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. With 6 constitutes a continuous year's course in modern European history. *Tu., Fri., Sat., at 10.20.*

6. *Europe since 1815*

The reconstruction of Europe after Napoleon; reaction and revolution; the Second Empire; unification of Italy; founding of the German Empire; the Third Republic; the Dual Monarchy; Russia and the Eastern Question; the Dual and Triple Alliances. *Professor* Collier.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates who have credit for 5; for others by special permission.

7. *English History, 1066–1689*

The formation of the English nation; growth of the constitution; economic development; struggle with France; the Tudor monarchy and the Reformation; the Stuarts and the Puritan Revolution; the Revolution of 1689. *Professor* COLLIER.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates, and for Sophomores who have credit for 1, 2. Introductory to 8. *Mon., Tu., Th., at 2.20.*

8. *English History, 1689–1895*

Rise of Cabinet government; colonial expansion; the industrial revolution; the struggle with Napoleon; political and social reform; international relations in the nineteenth century; Ireland and Home Rule. *Professor* COLLIER.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates, and for Sophomores who have credit for 1, 2. A continuation of 7, by which it should preferably be preceded. *Mon., Tu., Th., at 2.20.*

11, 12. *Seminary in European History*

Detailed study of a limited period or of a special phase of social or political development, with a view to training in historical investigation and the use of sources. *Professor* COLLIER.

Three hours. One to two hours of attendance. Through the year. Elective for Graduates and approved Seniors.

13, 14. *American History*

A general course, covering the whole period from the beginnings of English colonization to the present time. Intended as an introduction to the advanced courses in American history and for students who wish only a general survey of the subject. *Professor* MACDONALD.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates, and for Sophomores who have credit for 1, 2. Either semester may be elected independently, but 14 should preferably be preceded by 13. *Wed., Fri., Sat., at 11.20.*

[15, 16. *Constitutional and Political History of the United States*]

An advanced course covering the period from 1783 to the present time. Intended primarily for students who wish to specialize in American history or who expect to study law.

Three hours. Two hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates. Not offered in 1912–13.

17, 18. *Seminary in American History*

Designed to afford training in historical investigation and practice in the use of sources. The subjects vary from year to year, and are drawn from both the colonial and the constitutional periods. For 1912–13 the subjects are: First semester, The relations between the American Colonies and England, 1689–1760. Second semester, The influence of Europe upon American politics and culture, 1815–1850. *Professor* MacDonald.

Three hours. One to two hours of attendance. Through the year. Elective for Graduates and approved Seniors. The course should be preceded by 13, 14, or 15, 16, or 19, 20, but in exceptional cases may be taken by students who at the same time are taking 13, 14, or 15, 16, or 19, 20.

19. *Social History of America to 1800*

The historical development of political, social, and religious institutions in the colonial and early constitutional periods. *Professor* MacDonald.

Three hours. Two hours of attendance. First semester. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., at 12.20.*

20. *History of the United States since 1860*

A narrative course dealing especially with legal and constitutional development, party changes, and international relations. Intended primarily for students who wish to specialize in American history or who expect to study law. *Professor* MacDonald.

Three hours. Two hours of attendance. Second semester. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., at 12.20.*

XV. INDO-EUROPEAN PHILOLOGY

Francis Greenleaf Allinson, Ph.D., *David Benedict Professor of Classical Philology*

[2. *General Introduction to the Study of Language*]

Outline of the history of language; the Indo-European family. Adapted for students of ancient or modern languages.

Three hours. Second semester. Elective for Freshmen and Sophomores. Not offered in 1912–13.

4. *Seminary in Comparative Philology*

For advanced students in Greek and Latin.

Three hours. One two-hour session weekly. Second semester. Elective for Graduates and approved Seniors.

5, 6. *Sanskrit, Elementary Course*

Whitney's *Grammar;* Lanman's *Reader;* selections from the *Vedic Hymns.*

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

[7, 8. *Sanskrit, Advanced Course*]

Vedic Hymns, and other selections.

One hour. Through the year. Elective for students who have credit for 5, 6. Not offered in 1912–13.

XVI. MATHEMATICS

Nathaniel French Davis, A.M., LL.D., *Professor of Pure Mathematics*

Henry Parker Manning, Ph.D., *Associate Professor of Pure Mathematics*

Roland George Dwight Richardson, Ph.D., *Assistant Professor of Pure Mathematics*

Raymond Clare Archibald, Ph.D., *Assistant Professor of Pure Mathematics*

Clinton Harvey Currier, A.M., *Instructor in Mathematics*

INTRODUCTORY STATEMENT‡

For students who presented only Algebra and Plane Geometry for admission. Candidates for the degree of Bachelor of Arts, and those candidates for the degree of Bachelor of Philosophy who do not elect to take Argumentation in the Sophomore year, are required to take one of the following combinations of courses: (A) 1, 2; (B) 3, 4; (C) 3, 2. Students who intend to specialize in Mathematics are advised to take both 1, 2 and 3, 4 (or 17, 18); but if only three hours can be taken in the Freshman year, it is advisable to elect 3, 2.

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‡ Students wishing to specialize in Mathematics should take the undergraduate courses in the order 3, 2, 5, 6, 7, 8, 9, 10. Courses 1, 4, 12, 14, 15, together with as many of courses 21-44 as is possible, should be taken as opportunity offers in connection with the other courses.

It is recommended that students who contemplate teaching in the secondary schools elect courses 1-8, 43, 44, and at least one other course for a year.

Courses 9a, 17, 18, 19, 20 are for candidates for the degree of Bachelor of Science.

Courses 21-30 are designed primarily for Graduates. Two or three of these courses are offered each year according to the needs of students. For those who have taken all of them, other courses can usually be arranged.

Unless elected by three students, courses 10, 12, 15, 21-30, 43, and 44 may not be given.

For students who presented Solid Geometry and Plane Trigonometry for admission. Candidates for the degree of Bachelor of Arts, and those candidates for the degree of Bachelor of Philosophy who do not elect to take Argumentation in the Sophomore year, are required to take one of the following combinations of courses: (A) 3, 4; (B) 5, 6; (C) 5, 12. Students who intend to specialize in Mathematics are advised to take both 3, 4 and 5, 6; but if only one course can be taken in the Freshman year, it is advisable to take 5, 6.

1. *Solid and Spherical Geometry*

Professors MANNING, RICHARDSON, *and* ARCHIBALD, *Mr.* CURRIER.

Three hours. First semester. Required as noted in Introductory Statement. Elective for other Undergraduates who did not present Solid Geometry for admission. *One division, Tu., Fri., Sat., at 8 ; two divisions, Mon., Th., Fri., at 9.20; two divisions, Tu., Wed., Sat., at 9.20.*

2. *Plane Trigonometry*

Professors DAVIS *and* MANNING, *Mr.* CURRIER.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for other Undergraduates who did not present Plane Trigonometry for admission. *One division, Tu., Fri., Sat., at 8; two divisions, Mon., Th., Fri., at 9.20; two divisions, Tu., Wed., Sat., at 9.20.*

3. *Algebra*

Professor MANNING.

Three hours. First semester. Required as noted in Introductory Statement. Elective for Undergraduates. *Mon., Th., Fri., at 9.20.*

4. *Algebra*

Professor MANNING.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for students who have credit for 3. *Mon., Th., Fri., at 9.20.*

5. *Plane Analytic Geometry*

Professor DAVIS.

Three hours. First semester. Required as noted in Introductory Statement. Elective for students who have credit for Plane Trigonometry. *Tu., Wed., Sat., at 9.20.*

6. *Differential Calculus*

Professor Davis.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for students who have credit for 5. *Tu., Wed., Sat., at 9.20.*

7, 8. *Differential and Integral Calculus*

A continuation of 6. Granville's Differential and Integral Calculus (Revised Edition) will be used. *Professor* Archibald.

Three hours. Through the year. Elective for students who have credit for 6. *Tu., Th., Sat., at 12.20.*

9. *Differential Equations*

Professor Manning.

Three hours. First semester. Elective for students who have credit for 8 or 20. *Tu., Th., Sat., at 12.20.*

9 a. *Differential Equations*

Professor Manning.

Two hours. First semester. Required of candidates for the degree of Bachelor of Science in Electrical Engineering. *Tu., Th., at 12.20.*

10. *Differential Equations*

Professor Manning.

Three hours. Second semester. Elective for students who have credit for 9. *Tu., Th., Sat., at 12.20.*

12. *Modern Analytic Geometry*

Professor Manning.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for students who have credit for 5. *Mon., Wed., Fri., at 12.20.*

[14. *Solid Analytic Geometry*]

Professor Archibald.

Three hours. Second semester. Elective for students who have credit for 5. Not offered in 1912–13.

15. *Spherical Trigonometry*

Mr. Currier.

Two hours. First semester. Elective for students who have credit for Plane Trigonometry, and have not taken Spherical Trigonometry in college. *Mon., Wed., at 8.*

17, 18. *Engineering Mathematics*

Advanced Algebra. Plane and Spherical Trigonometry, Analytic Geometry. *Professors* DAVIS, MANNING, *and* ARCHIBALD, *Mr.* CURRIER.

Six hours. Through the year. Required of candidates for the degree of Bachelor of Science. *Mon., Tu., Wed., Th., Fri., Sat., at 11.20.*

19, 20. *Differential and Integral Calculus*

Professors DAVIS *and* RICHARDSON.

Four hours. Through the year. Required of candidates for the degree of Bachelor of Science. *One division, Tu., Wed., Sat., at 9.20, Th. at 8; one division, Tu., Fri., Sat., at 10.20, Wed. at 8.*

[21, 22. *Function Theory of a Complex Variable*]

Three hours. Through the year. Elective for Graduates and approved Seniors. Not offered in 1912–13.

[23, 24. *Differential Equations, Advanced Course*]

Three hours. Through the year. Elective for Graduates who have credit for 21, 22. Not offered in 1912–13.

25, 26. *Advanced Algebra*

Among the subjects discussed are the following: linear dependence; systems of linear equations; linear transformations; algebraic invariants; bilinear and quadratic forms; factoring of polynomials in one and in several variables. *Professor* RICHARDSON.

Three hours. Through the year. Elective by special permission of the instructor.

[27, 28. *Differential Geometry*]

Three hours. Through the year. Elective for Graduates and approved Seniors. Not offered in 1912–13.

29, 30. *Function Theory of a Real Variable*

The foundations of the differential calculus; definite integrals; line integrals; multiple integrals; infinite series. *Professor* RICHARDSON.

Three hours. Through the year. Elective for students who have credit for 25, 26, and for others by special permission.

43, 44. *Foundations, Methods, and Problems of Geometry*

Designed for those who expect to teach Mathematics. The principal subjects included in the course will be: foundations (considerable time will be devoted to this topic); Euclid and his modern rivals; American, English, French, German, and Italian texts; Euclidean, Mascheronian, and Steinerian constructions; methods for problem-solving; geometrography; famous problems; history. *Professor* ARCHIBALD.

Three hours. Through the year. Elective for Graduates and Undergraduates who have credit for 3, 4, or 25, 26, and for others by special permission.

XVII. MECHANICAL ENGINEERING‡

WILLIAM HERBERT KENERSON, M.E., A.M., *Associate Professor of Mechanical Engineering*

THURSTON MASON PHETTEPLACE, M.E., A.M., *Assistant Professor of Mechanical Engineering*

HENRY DEWEES CADY, *Instructor in Shop Practice*

JAMES ALEXANDER HALL, A.B., Sc.B., *Assistant in Mechanical Engineering*

1. *Wood-work*

Exercises in carpentry and wood-turning. Assigned reading and written reports. *Mr.* CADY.

Two hours. Five hours of attendance. First semester. *Tu., 2 to 5; Fri., 2 to 4.*

2. *Wood-work*

Exercises in pattern-making. Assigned reading and written reports. *Mr.* CADY.

Two hours. Five hours of attendance. Second semester. *Mon., Th., 2 to 4; Wed. at 11.20.*

3, 4. *Metal-work*

Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. Assigned reading and written reports. *Mr.* CADY.

Two hours. Five hours of attendance. Through the year. First semester, *Mon. at 10.20; Tu., Fri., 2 to 4.* Second semester, *Wed., 2 to 4; Fri., 2 to 5.*

5. *Metal-work*

Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. Assigned reading and written reports. *Mr.* Cady.

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‡ All the courses in this department except 6 and 7 are required of candidates for the degree of Bachelor of Science in Mechanical Engineering, and, with the exception of 1-5, are elective for other students.

Three hours. Seven hours of attendance. First semester. *Tu., Fri., 2 to 5; Fri. at 9.20.*

6. *Wood-work*

Exercises in carpentry, wood-turning, and pattern-making. *Mr.* Cady.

Three hours. Seven hours of attendance. Elective in either semester for Sophomores, Juniors, and Seniors, who have had instruction in drawing. First semester, *Tu., Fri., 2 to 5.* Second semester, *Mon., Th., 2 to 5.*

7. *Metal-work*

Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. *Mr.* Cady.

Three hours. Seven hours of attendance. Elective in either semester for Sophomores, Juniors, and Seniors, who have had instruction in drawing. First semester, *Tu., Fri., 2 to 5.* Second semester, *Mon., Th., 2 to 5.*

8. *Kinematics*

Velocity ratios, rolling surfaces, cams, and belting. Recitations, drawing, and the solution of problems. *Professor* Phetteplace.

Three hours. Seven hours of attendance. Second semester. Elective for students who have credit for Mechanical Drawing 5. *Tu. at 12.20 and 2.20 to 5.20; Fri., 2.20 to 5.20.*

9, 10. *Kinematics, Continued*

Gearing, linkwork, parallel motions, and gear trains; machine tools; the application of the principles involved. Recitations, drawing, and the solution of problems. *Professor* Phetteplace.

Three hours. Seven hours of attendance. Through the year. Elective for students who have credit for 8 and for Mechanical Drawing 5. *Mon., 2.20 to 5.20; Wed. at 10.20; Th., 2.20 to 5.20.*

11, 12. *Machine Design*

Applications of the principles of mechanics and the strength of materials to the design of representative types of boilers, engines, and various mechanisms; solution of problems illustrating the method of designing bolts and nuts, keys, journals and bearings, fly-wheels, valve-gears, etc. Lectures, calculation, and drawing. *Professor* Phetteplace.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 9, 10, and Mechanics 2. *Mon., Th., 10.20 to 1.20.*

14. *General Engineering and Design*

Lectures; discussion of special engineering problems, patents and patent law, and cost systems. *Professors* Kenerson *and* Phetteplace.

Two hours. Second semester. *Tu., Wed., 10.20 to 12.20.*

15, 16. *Thermodynamics*

Applications of the principles of gases and vapors to steam, gas, and other heat engines, air-compressors, refrigerating apparatus, etc.; discussion of the energy of fuel and the utilization of such energy for power purposes by means of various media; laws of the relation of variations of pressure, temperature, and volume of such media; analysis of the various cycles used in heat engines; the principles of the injector and the ejector. *Professor* Kenerson *and Mr.* Hall.

Three hours. Through the year. Elective for students who have credit for Physics 1, 2. *Tu., Wed., Sat., at 9.20.*

17, 18. *Engineering Practice*

Applications of the principles of thermodynamics and mechanics to the production, transmission, utilization, and measurement of power; valves and valve gears, and valve setting; indicator practice and tests of various forms of steam engines, gas engines, etc.; standardization of auxiliary apparatus used in making the various tests; boiler testing; flue gas and fuel analysis, etc. Lectures, recitations, and laboratory work. *Professor* Kenerson *and Mr.* Hall.

Three hours. Through the year. Elective for students who have credit for or are taking 15, 16. First semester, *Wed. at 8; Th., 2.20 to 4.20; Sat. at 10.20.* Second semester, *Wed., Fri., at 11.20; Sat. at 10.20; Th., 2.20 to 4.20.*

19, 20. *Materials of Engineering*

Study of the sources, manufacture, and properties of the important materials used in engineering; laboratory tests to determine the behavior of materials when subjected to tensile, compressive, and torsional stresses; mixing and testing of cements and mortars; preparation and examination of sections for the microscopical study of the structure of metals and alloys. Lectures, recitations, and laboratory work. *Professor* Kenerson *and Mr.* Hall.

Three hours. Through the year. Elective for students who have credit for or are taking Mechanics 1. *Tu., Fri., at 10.20. 1st div., Mon., 2.20 to 4.20; 2d div., Tu., 2.20 to 4.20; 3d div., Th., 2.20 to 4.20; 4th div., Mon., 9.20 to 11.20.*

21. *Power Plant Engineering*

Discussion of the relation and coördination of the various parts of the complete power plant; management, and methods of determining efficiency; selection of the best equipment from manufacturers' catalogues and actual inspection. Lectures, recitations, tests, and tours of inspection. *Professor* PHETTEPLACE.

Three hours. First semester. Elective for students who have credit for 15, 16. *Tu., Fri., 2.20 to 5.20; Wed., Sat., at 9.20.*

22. *Advanced Laboratory Course*

Steam, gas, and power engineering. Particular emphasis laid on preparation and form of reports. *Professor* KENERSON *and Mr.* HALL.

Three hours. Second semester. *Tu., Fri., 2 to 5.*

24. *Applied Hydraulics*

Laboratory experiments in connection with Mechanics 4. *Professor* KENERSON.

One hour. Second semester. Must be taken with Mechanics 4 and Civil Engineering 34.

25, 26. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Mechanical Engineering. The thesis must embody a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XVIII. MECHANICS AND MECHANICAL DRAWING

OTIS EVERETT RANDALL, PH.D., *Professor of Mechanics and Mechanical Drawing*

ANSEL BROOKS, PH.B., M.E., *Associate Professor of Mechanics and Mechanical Drawing*

JOHN JOSEPH LONG, PH.B., *Instructor in Mechanical Drawing*

MECHANICS

1, 2. *Mechanics of Solids*

Statics, including resolution and composition of forces, determination of center of gravity, and problems relative to rigid bodies and flexible cords; dynamics, including rectilinear and curvilinear motion, virtual velocity, moment of inertia, work, energy and power, and friction; strength of materials, including tension, compression, shearing, torsion, and flexure; methods of graphical solution of problems. *Professors* RANDALL *and* BROOKS.

Four hours. Through the year. Required of candidates for the degree of Bachelor of Science. Elective for students who have credit for Mathematics 7, 8. *Mon., Tu., at 11.20; Th., 10.20 to 12.20.*

3. *Mechanics of Fluids*

Hydrostatics; nature and use of instruments; flow through orifices, over weirs, through tubes, through pipes, in conduits; flow of rivers; water supply and water power. *Professors* RANDALL *and* BROOKS.

Three hours. First semester. Required of candidates for the degree of Bachelor of Science. Elective for students who have credit for 1, 2. *Wed., Fri., Sat., at 11.20.*

4. *Applied Hydraulics*

Dynamics of water; theoretical consideration of water wheels, pumps, and pumping machinery. *Professors* RANDALL *and* BROOKS.

One hour. Second semester. Required of candidates for the degree of Bachelor of Science. Elective for students who have credit for 3. Must be taken with Civil Engineering 34, and Mechanical Engineering 24. *Wed. at 11.20.*

5, 6. *Mathematical Mechanics*

Comprehensive treatment of the principles of statics and dynamics; strength of materials; higher theoretical and practical problems. Intended primarily for students who are interested in the application of the principles of pure mathematics. *Professor* RANDALL.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for Mathematics 7, 8.

MECHANICAL DRAWING

1, 2. *Elementary Mechanical Drawing*

Nature, care, and use of drafting instruments; lettering; plane problem construction; curve tracing; elementary projection. *Professors* RANDALL *and* BROOKS, *Mr.* LONG.

Two hours. Four hours of drawing. Through the year. Required in the Freshman year of candidates for the degree of Bachelor of Science. *Tu., Fri., 2.20 to 4.20.*

3, 4. *Descriptive Geometry*

Discussion, proof, and graphic solution of problems relating to the point, line, and plane, line and surface generation and classification, surface tangency, intersections, and developments; application of the principles of descriptive geometry in isometric drawing, shades and shadows and perspective, machine drawing, and practical engineering problems. *Professors* Randall *and* Brooks, *Mr.* Long.

Three hours. Two hours of recitation and three hours of drawing. Through the year. Required in the Sophomore year of candidates for the degree of Bachelor of Science. Elective for students who have credit for 7, 8. *Mon., Tu., Th., Fri., Sat., at 9.20; Tu., Sat., at 10.20.*

5. *Machine Drawing*

Study and representation of machine parts; the principles of elementary machine design; sketches, detail and assembly drawings of machines; practice in reading drawings. *Professor* Brooks *and Mr.* Long.

Three hours. One hour of recitation and eight hours of drawing. First semester. Required of candidates for the degree of Bachelor of Science in Mechanical Engineering or Electrical Engineering. Elective for students who have credit for 7, 8. *Tu. at 12.20; Mon., Th., 2.20 to 5.20.*

7, 8. *Elementary Mechanical Drawing*

Nature, care, and use of drafting instruments; lettering; plane problem construction; curve tracing; elementary projection. *Professors* Randall *and* Brooks, *Mr.* Long.

Three hours. Six hours of drawing. Through the year. Elective for Undergraduates. *Tu., Fri., 2.20 to 4.20; Wed., 2 to 6.*

XIX. MUSIC

Hamilton Crawford Macdougall, Mus.D., *Lecturer in Music*

3. *Advanced Harmony*

A sequel to Elementary Harmony [Music 2. *See* Catalogue 1911–12]. A course in the harmonization of melodies and basses; the nature and use of the various diatonic and chromatic chords in the major and minor keys; non-harmonic tones; modulation; the writing of pieces in the smaller monophonic forms, such as the song, anthem, part-song, short pieces for piano, piano and violin, etc. Frequent tests; daily work.

Three hours. First semester. Elective for students who have credit for Elementary Harmony [Music 2] or its equivalent. *Mon., Wed., at 12.20.*

4. *The Opera*

The development of the opera from 1600 to the present day. Designed to give familiarity with the more famous operas, especially those in the modern operatic repertoire. Assigned readings, written tests, written reports.

Three hours. Second semester. Elective for Sophomores, Juniors, and Seniors. No previous knowledge of music required. *Mon., Wed., at 12.20.*

XX. PHILOSOPHY

WILLIAM HERBERT PERRY FAUNCE, A.M., D.D., LL.D., *Professor of Moral and Intellectual Philosophy*

EDMUND BURKE DELABARRE, PH.D., *Professor of Psychology*

WALTER GOODNOW EVERETT, PH.D., *Professor of Philosophy and Natural Theology*

ALEXANDER MEIKLEJOHN, PH.D., *Professor of Logic and Metaphysics*

HARRIS MERRILL BARBOUR, A.B., B.D., *Assistant in Philosophy*

1, 2. *Logic*

A study of the aims, concepts, problems, methods, and results of thinking; a preparation for work in the sciences and in philosophy. The main topics are the logic of deduction, the definition of truth, and the relations of science, philosophy, and religion. *Professor* MEIKLEJOHN.

Three hours. Through the year. Elective for Sophomores and Juniors. *Mon., Th., Fri., at 9.20.*

3, 4. *Psychology and Ethics*

An introductory course dealing in a concrete way with the moral values of daily experience, and intended to aid the student in forming a practical philosophy of life. First semester: Psychology. A survey of the main facts and laws of mental life, aiming to provide a sound foundation for further acquaintance with this and allied subjects, for an improved judgment in dealing with many practical problems, and for understanding the psychological bases of philosophy. Second semester: Ethics. First semester, *Professor* DELABARRE. Second semester, *Professor* EVERETT.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Either semester may be elected independently by Seniors only. *Tu., Wed., Sat., at 9.20.*

5, 6. *Psychology, Intermediate Course*

A study of the fundamental principles on which a scientific system of psychology must be based. The nature and composition of consciousness, its relation to bodily processes, and its complete subjection to law. The criteria for accepting evidence and forming sound judgments in connection with the problems of so-called "psychical research." *Professor* DELABARRE.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for a course in Psychology. *Wed., Fri., Sat., at 11.20.*

7, 8. *History of Philosophy*

The successive philosophical systems as revealing the logical development of European philosophy. The treatment also aims to exhibit the significant relations which philosophy has sustained to civilization, especially in its fundamental political, scientific, religious, and cultural elements. *Professor* EVERETT.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

9. *Philosophy of Religion*

A study of the nature of the religious consciousness, and of the ultimate problems of religious psychology and belief. *Professor* EVERETT.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates who have credit for a year course in Philosophy. *Tu., Wed., Sat., at 9.20.*

11, 12. *Experimental Psychology, Introductory Laboratory Course*

Description of the main lines and results of experimental research; demonstrations by the instructor or the class; training in the use of apparatus and in careful scientific observation and measurement. *Professor* DELABARRE.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3.

[13, 14. *Problems of Modern Philosophy*]

A seminary course designed to give acquaintance with current philosophical problems and discussions.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for a year course in Philosophy. Not offered in 1912–13.

15, 16. *Kantian and Post-Kantian Philosophy*

Kant's *Critique of Pure Reason* studied as a source of modern philosophical theories. *Professor* MEIKLEJOHN.

Three hours. Through the year. Elective for Seniors who have credit for 7, 8, and for Graduates.

17, 18. *Psychology, Advanced Course*

A seminary for the discussion of important problems in psychology. The problems discussed will vary, and the course may be extended over several years if desired. *Professor* DELABARRE.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3.

19, 20. *Experimental Psychology, Advanced Laboratory Course*

The aim is to study further the problems of experimental psychology, and, whenever possible, to make original contributions to scientific knowledge. The problems investigated vary, and the course may be taken two or more years in succession. *Professor* DELABARRE.

One to six hours. Two to twelve hours of attendance. Through the year. Elective for students who have credit for 11, 12. May be taken for more than six hours by Graduates.

20, 21. *Advanced Ethics*

A seminary course for the study of the more important problems of ethical theory. Lectures, written reports, and discussions. Subject for 1912–13: Problems in Practical Ethics. *Professor* EVERETT.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for a year course in philosophy.

[23, 24. *Philosophical Seminary*]

A seminary for the study of the problems of historical and contemporary thought. Reading, written reports, and discussions.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for a year course in philosophy. Not offered in 1912–13.

XXI. PHYSICS

Carl Barus, Ph.D., LL.D., *Hazard Professor of Physics*
Albert deForest Palmer, Ph.D., *Associate Professor of Physics*
Arthur Eugene Watson, Ph.D., *Assistant Professor of Physics*
Robert Franklin Field, A.M., *Instructor in Physics*

1, 2. *Elementary Physics* ‡

Designed for those who have had little previous training in physics. First semester, dynamics, molecular physics, and heat. Second semester, optics, acoustics, and electricity. The more elementary features of the subjects discussed. Lectures illustrated by experiments and the lantern; weekly written exercises. *Professor* Barus.

Three hours. Through the year. Required of all candidates for the degree of Bachelor of Science. Elective for Undergraduates who have credit for entrance algebra and plane geometry. *Mon., Wed., Th., at 10.20.*

3, 4. *Elementary Physics, continued* §

Treats the more advanced parts of the subjects taken in the same order as in the preceding course. *Professor* Barus.

Three hours. Through the year. Elective for students who have credit for 1, 2, and Mathematics 1, 2. *Tu., Fri., Sat., at 10.20.*

5, 6. *Experimental Physics*

An introduction to the theory and practice of physical manipulation. Experimental study of physical phenomena selected to meet the needs of individual students. Written reports and solution of problems. *Professor* Palmer.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2.

7, 8. *Mathematical Treatment of Dynamical Problems* ||

First semester, discussion of the general principles of dynamics and the development of the general equations of motion. Second semester, application of these principles to special problems in thermodynamics and hydrodynamics. *Professor* Palmer.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 5, 6, and Mathematics 9, 10.

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‡ Students who intend to teach physics should elect courses 1, 2; 3, 4; 5, 6.

§ Graduates taking course 3, 4 are held responsible for all the demonstrations, or for the full equivalent of either Watson's or Daniel's *Principles of General Physics.*

|| In determining which of the two courses 7, 8, and 9, 10, shall be offered in any given year, the preference of students will be considered.

9, 10. *Mathematical Theory of Electricity and Magnetism* ‡

Includes a discussion of the more important problems of electrical science. *Professor* PALMER.

Three hours. Through the year. Elective for Graduates and Seniors who have credit for 5, 6, and Mathematics 9, 10.

11, 12. *Advanced Laboratory Course*

Special problems and reference to original sources for methods of solution. *Professors* BARUS, PALMER, *and* WATSON.

Three or six hours. Six or twelve hours of attendance. Through the year. Elective for students who have credit for 5, 6.

13, 14. *Applied Harmonic Analysis and Applied Vector Analysis* §

Importance of Fourier's method shown by examples drawn from the analytical theory of heat, from elastics, alternating electricity, and elsewhere; treatment by the aid of spherical harmonics. Bessel functions and Lamé functions; the chief theorems of vector analysis produced and applied to dynamics, elastics, hydrodynamics, the electro-magnetics of Maxwell and Hertz, and the electronic theory of Heaviside, Lorentz, and others. *Professor* BARUS.

Three hours. Through the year. Required in the second semester of candidates for the degree of Bachelor of Science in Electrical Engineering. Elective for Seniors and Graduates who have credit for 1, 2, and Mathematics 7, 8.

15, 16. *Physics, Advanced Course* §

Lectures on dynamics, potential, elastics, hydrostatics, hydrodynamics, viscosity, capillarity, electrostatics, magnetism, electro-magnetism, thermo-electrics, induction, Fresnel's optics, the electromagnetic theory of light, thermal analytics, and thermodynamics. *Professor* BARUS.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for Mathematics 7, 8.

21, 22. *Theory of Measurements*

Lectures and recitations on the theory and precision of measurements, and on methods of taking, recording, and reducing observations; laboratory instruction in selected physical measurements. *Professor* PALMER *and Mr.* FIELD.

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‡ In determining which of the two courses 7, 8, and 9, 10, shall be offered in any given year, the preference of students will be considered.

§ In determining the content of courses 13, 14, and 15, 16, the preference of students will be considered.

Three hours. Five hours of attendance. Through the year. Required of candidates for the degree of Bachelor of Science. Elective for students who have credit for 1, 2, and Mathematics 7, 8, or 19, 20. *1st div., Mon., Tu., at 12.20; 2d div., Mon., Th., at 12.20.* Laboratory hours will be posted in 11 Wilson Hall on the first day of each term.

23, 24. *Precision Measurements in Photometry, Electricity, and Magnetism*

Professor PALMER.

Four hours. Eight hours in the laboratory. Through the year. Elective for students who have credit for 5, 6, or 21, 22, and Mathematics 7, 8, or 19, 20.

25, 26. *Radiation, Optics, and Heat*

Experimental study of selected phenomena; demonstrations and personal conferences. *Professor* PALMER.

Three or six hours. Six or twelve hours in the laboratory. Through the year. Elective for students who have credit for 5, 6, or 21, 22.

ELECTRICAL ENGINEERING‡

Professor WATSON *and Mr.* FIELD

1, 2. *General Course*

Methods of generating and utilizing electric currents; theory and working of dynamo-electric machinery.

Three hours. Two hours of recitation or lecture and two hours in the laboratory. Elective for students who have credit for or are taking Physics 5, 6, or 21, 22, and Mathematics 6 or 19. First semester, *Mon., Th., at 9.20.* Second semester, *Mon., Fri., at 9.20.* Laboratory assignments for afternoons.

3, 4. *Alternating Currents*

Mathematical and graphical treatment.

Three hours. Two hours of recitation or lecture and two hours in the laboratory. Through the year. Elective for students who have credit for 2, and who have credit for or are taking Mathematics 9 or 9a. *Tu., Fri., at 10.20.* Laboratory assignments for afternoons.

6. *Calculation and Design of Direct Current Electrical Machinery*

Three hours. Second semester. Must be taken with 2. Not elective. *Tu., Wed., Th., at 9.20.*

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‡ All the courses in Electrical Engineering are required of candidates for the degree of Bachelor of Science in Electrical Engineering. 1, 2 is required of candidates for the degree of Bachelor of Science in Mechanical Engineering. 1 is required of candidates for the degree of Bachelor of Science in Civil Engineering.

7. *Telegraph and Telephone Engineering*

Three hours. First semester. Elective for students who have credit for 2. *Mon., Wed., Th., at 10.20.*

8. *Alternating Current Machinery*

Calculation and design of generators, motors, transformers, etc.

Three hours. Second semester. Must be taken with 10. Elective for students who have credit for 1, 2, and 3. *Mon., Th., Fri., at 9.20.*

10. *Power and Lighting Stations*

Equipment and systems of distribution.

Three hours. Second semester. Must be taken with 8. Elective for students who have credit for 1, 2, and 3. *Mon., Wed., Th., at 10.20.* Weekly trips of inspection.

12. *Electrical Engineering Problems*

Reading and discussion. Seminary method.

One hour. Second semester. Not elective. *Mon. at 11.20.*

13, 14. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Electrical Engineering. The thesis must embody a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XXII. ROMAN LITERATURE AND HISTORY

ALBERT GRANGER HARKNESS, A.M., LITT.D., *Professor of Roman Literature and History*

JOHN FRANCIS GREENE, A.M., *Associate Professor of Roman Literature and History*

1. *Livy*

Designed to enable the student to acquire facility in reading Latin, and to instruct him in the use of the Latin texts as a means of gaining a knowledge of Roman history; grammatical study and literary criticism also receive attention. *Professors* HARKNESS *and* GREENE.

Three hours. First semester. Elective for students who presented elementary and advanced Latin for admission. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Tu., Th., Sat., at 12.20.*

2. *Cicero's Letters*

Aims and methods as in 1. *Professors* Harkness *and* Greene.

Three hours. Second semester. Elective for students who presented elementary and advanced Latin for admission. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Tu., Th., Sat., at 12.20.*

3. *Horace's Odes and Epodes, Tibullus, Propertius*

Critical study of the poems, supplemented by rapid reading with a view to comprehending the spirit of the author; the literary side of the study is made prominent. Lectures; literary topics assigned to the class for special study. *Professor* Greene.

Three hours. First semester. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

4. *Horace's Satires and Epistles, Juvenal*

Aims and methods as in 4. *Professor* Harkness.

Three hours. Second semester. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

[5, 6. *Latin Poetry*]

Aims to give a connected and comprehensive view of the history and development of Latin poetry. Lectures on the lives and writings of the authors; reading of characteristic selections; special study by members of the class of assigned topics in literary history and criticism. First semester, Plautus. Second semester, Lucretius and Catullus. Forms with 7, 8 a two-year consecutive course, affording a general survey of Roman literature. *Professors* Harkness *and* Greene.

Three hours. Through the year. Elective for Juniors and Seniors. Either semester may be elected independently. Not offered in 1912–13.

7, 8. *Latin Prose*

Aims to give a connected and comprehensive view of the history and development of Latin prose. Lectures on the lives and writings of the authors, on the development of oratory, etc.; reading of characteristic selections; special study, by members of the class, of assigned topics in literary history and criticism. First semester, specimens of early Latin, Cicero's *Brutus*, and Quintilian. Second semester, the *Annals* of Tacitus. Forms with 5, 6 a two-year consecutive course, affording a general survey of Roman literature. *Professors* Harkness *and* Greene.

Three hours. Through the year. Elective for Juniors and Seniors. Either semester may be elected independently. *Tu., Wed., Sat., at 9.20.*

9, 10. *Petronius, Pliny the Younger, Martial*

Professor Harkness.

One hour. Through the year. Elective for Juniors, Seniors, and Graduates. *Fri. at 2.20.*

[11, 12. *Latin Composition*]

Professor Greene.

One hour. Through the year. Elective for Sophomores, Juniors, and Seniors. Not offered in 1912–13.

13, 14. *History of the Roman Empire*

The Early Empire. The Age of the Antonines. The Age of Constantine. *Professor* Greene.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Either semester may be elected independently. *Tu., Wed., Sat., at 9.20.*

16. *Roman Civilization*

An outline of Roman civilization and its influence on modern times. Special attention will be given to the literature and to the political and social life. No knowledge of Latin required. Must be preceded in the first semester by Greek 15, Greek Civilization. The two semesters together constitute the course in Classical Civilization. *Professors* Harkness *and* Greene.

Three hours. Second semester. Required in the Freshman or Sophomore year of candidates for the degree of Bachelor of Philosophy. Not elective. *1st div., Mon., Th., Fri., at 9.20; 2d div., Mon., Tu., Th., at 11.20.*

17, 18. *Seminary in Latin*

Subject for 1912–13: Reading from the poetry of the Empire. Gudeman's *Latin Literature of the Empire,* vol. ii. Questions in textual criticism and in the structure of Latin verse will be considered. *Professors* Harkness *and* Greene.

Three hours. Two hours of attendance. Through the year. Elective for Graduates.

XXIII. ROMANCE LANGUAGES AND LITERATURES

COURTNEY LANGDON, A.B., *Professor of the Romance Languages and Literatures*

ALBERT BUSHNELL JOHNSON, A.M., *Associate Professor of the Romance Languages and Literatures*

CHARLES HERMAN HUNKINS, DR. *de l'Université de Paris, Assistant Professor of the Romance Languages and Literatures*

HENRI FELIX MICOLEAU, *Instructor in French*

BERNARD KEENAN, A.M., *Assistant in French*

1, 2. *Elementary Course, First Year*

Grammar, composition, dictation, conversation; translation of selections from modern authors into idiomatic English. *Professor* HUNKINS *and Mr.* KEENAN.

Three hours. Through the year. Elective for students who did not present French for admission. *1st div., Tu., Th., Sat., at 8; 2d div., Mon., Tu., Th., at 2.20.*

3, 4. *Elementary Course, Second Year*

Reading of easy modern French prose in the form of stories, plays, or historical or biographical sketches; review of grammar; composition and conversation based upon the texts read. *Mr.* MICOLEAU.

Three hours. Through the year. Elective for students who have credit for 1, 2. *Wed., Fri., Sat., at 11.20.*

5, 6. *Intermediate Course*

Reading of modern and classical authors; review of grammar; composition and conversation based upon the texts read; dictation. *Professor* HUNKINS, *Messrs.* MICOLEAU *and* KEENAN.

Three hours. Through the year. Elective for students who have credit for 3, 4, or who presented elementary French for admission. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Tu., Th., Fri., at 8; 3d div., Mon., Th., Fri., at 9.20; 4th div., Mon., Wed., Th., at 8.*

7, 8. *Advanced Course*

An introduction to classical and modern French literature; composition; conversation based on the texts read; dictation. *Professors* JOHNSON *and* HUNKINS, *Mr.* MICOLEAU.

Three hours. Through the year. Elective for students who have credit for 5, 6, or who presented advanced French for admission. *1st div., Mon., Tu., Th., at 11.20; 2d div., Mon., Tu., Th., at 11.20; 3d div., Tu., Wed., Sat., at 9.20.*

[9, 10. *The Realistic School*]

Flaubert, Augier, the younger Dumas, the Goncourts, Daudet, Zola, Taine, Loti, and others; abstracts, in French, of works read outside the class; sight reading a prominent feature.

Three hours. Through the year. Elective for students who have credit for 7, 8. Not offered in 1912–13.

11, 12. *The Romantic School*

The history of the romantic school; reading of authors from Chateaubriand and Victor Hugo to Rostand; abstracts on outside reading. Lectures in English and in French. *Professor* LANGDON.

Three hours. Through the year. Elective for students who have credit for 7, 8. *Wed., Fri., Sat., at 11.20.*

13, 14. *The Classical School*

The history of the classical school; its formation, its apogee, and its decline. Lectures in French. *Mr.* MICOLEAU.

Three hours. Through the year. Elective for students who have credit for 9, 10, or 11, 12, and for approved students who have credit for 7, 8. *Mon., Tu., Th., at 11.20.*

15, 16. *Modern Spanish*

Grammar, conversation, composition, and reading of modern authors. *Professor* JOHNSON.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern language. *Tu., Fri., Sat., at 10.20.*

17, 18. *Modern Italian*

Grammar, composition, and reading of modern authors. *Professor* LANGDON.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern language. *Mon., Th., Fri., at 9.20.*

19, 20. *Dante in English*

A study of the whole of the *Divina Commedia* in English, in the light of modern thought and of other world-poems. *Professor* LANGDON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Students are advised to elect this course in their Senior year. *Mon., Tu., Th., at 11.20.*

21, 22. *Spanish Language and Literature*

Selected works of classical and modern authors; composition; conversation. *Professor* Johnson.

Three hours. Through the year. Elective for students who have credit for 15, 16. *Wed., Fri., Sat., at 11.20.*

23, 24. *Practice in Writing and Speaking French*

Intended especially for those preparing to teach. Written and oral translations from English into French. Recitations and dialogues in French. Conversation. Dictation. Phonetics. *Professor* Johnson.

Three hours. Through the year. Elective for students who have credit for 7, 8. *Mon., Th., Fri., at 9.20.*

XXIV. SOCIAL AND POLITICAL SCIENCE‡

James Quayle Dealey, Ph.D., *Professor of Social and Political Science*

Lester Frank Ward, A.M., LL.D., *Professor of Sociology*

John Corliss Dunning, LL.B., Ph.D., *Instructor in Social and Political Science*

SOCIAL SCIENCE

1. *Elementary Social and Political Science*

Affords a general outline of these subjects and serves as an introduction to the more extended and special courses which follow. *Professor* Dealey.

Three hours. In connection with Economics 1 constitutes a year course required in Sophomore, Junior, or Senior year of candidates for the degree of Bachelor of Arts and Bachelor of Philosophy, and in Sophomore year of candidates for the degree of Bachelor of Science. The combined courses will be given in two divisions. For the first division Economics will precede Social and Political Science; for the second, the order will be reversed. *1st div., second semester, Tu., Fri., Sat., at 10.20; 2d div., first semester, Mon., Wed., Fri., at 12.20.*

3, 4. *Social Problems and Conditions*

First semester, development of modern social institutions and problems involved; modern domestic institutions. Second semester, modern social problems, such as charity, crime, intemperance, immigration, and racial questions of western civilization. Social legislation. *Professor* DEALEY *and Dr.* DUNNING.

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‡ The courses in this department other than 1 are open only to those students who have credit for Social and Political Science 1 and Economics 1.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

5, 6. *Origin and Development of Society* ‡

First semester, formation and dispersion of primitive groups; origin of races; union and coalescence of groups; the race struggle; institutions growing out of the race struggle; stages of culture. Second semester, domestic relations; kinship groups; marriage and the family; institutions growing out of domestic relations; gentile society; transition to political society; primary institutions. *Professor* WARD.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

7. *Sociology as a Science* ‡

Its relations to other sciences; its psychologic basis; its fundamental principles and their sources in the less complex sciences. *Professor* WARD.

Three hours. First semester. Followed in the second semester by 8. Elective for Seniors and Graduates. *Wed., Fri., Sat., at 11.20.*

8. *Application of Sociological Principles* ‡

The utility of sociology as a means of increasing human achievement. The improvement of society through conscious effort. Scientific legislation. *Professor* WARD.

Three hours. Second semester. Preceded by either 5, 6, or 7. Elective for Seniors and Graduates. *Wed., Fri., Sat., at 11.20.*

9, 10. *Sociological Aspects of Education*

First semester, the sociological theory of education. The social importance of intellectual development and of the diffusion of knowledge. Second semester, the sociological curriculum; survey of the several fields of knowledge in the order of nature. *Professor* WARD.

Three hours. Through the year. Elective for Seniors and Graduates. *Tu., Fri., 4.30 to 6.*

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‡ Course 5, 6 deals with the subject chiefly from the historical standpoint. Course 7 deals mainly with the principles and theory of sociology. Undergraduates should not elect both of these courses in the same year, and 5, 6 should precede 7. Course 8 may properly follow either of these.

11, 12. *Sociological Theories*

First semester, ancient and medieval theories in respect to social conditions and development; precursors of sociology. Second semester, sociological theories since the opening of the nineteenth century; a review of modern sociological thought in Europe and America and its influence on the life and institutions of society. *Professor* DEALEY.

Three hours. Through the year. Offered if applied for by Graduates.

13, 14. *Investigation of Special Topics*

Intended to train the student in methods of gathering, handling, and presenting data in the study of social problems. For the year 1912–13 the subject will be: Social Legislation and Social Welfare, including a study of social statistics. *Professor* DEALEY.

Three hours. Six hours of attendance. Through the year. Elective for Graduates, and for a limited number of approved Juniors and Seniors. Either semester may be elected independently.

POLITICAL SCIENCE

1. *Elementary Political and Social Science*

See Social Science 1.

3, 4. *Government and Politics of the United States*

First semester, national government, its organization, powers, and methods; current political issues. Second semester, state and municipal governments; framework and activities of European and American municipalities. *Professor* DEALEY, *Dr.* DUNNING.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

5. *Governments and Politics of Foreign States*

The political systems of typical leading states, including some of the states of Latin-America. Current international political situations and problems. *Dr.* DUNNING.

Three hours. First semester. Followed in the second semester by 6. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

6. *International Relations*

International rules of peace and war. Diplomatic usage. History and methods of arbitration. *Dr.* DUNNING.

Three hours. Second semester. Preceded in the first semester by 5. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

7. *Jurisprudence*

The development of law and of its fundamental principles. Special reference to Roman law and to the English common law. *Dr.* DUNNING.

Three hours. First semester. Followed in the second semester by 8. Elective for Seniors and Graduates. *Tu., Wed., Sat., at 9.20.*

8. *Constitutional Law*

Principles and development of American constitutional law. Case system. *Dr.* DUNNING.

Three hours. Second semester. Preceded in the first semester by 7. Elective for Seniors and Graduates. *Tu., Wed., Sat., at 9.20.*

9. *Development of Political Theories*

Classical and medieval political theories. Development of modern democratic theories in England, France, and the United States. *Dr.* DUNNING.

Three hours. First semester. Followed in the second semester by 10. Offered if applied for by Graduates.

10. *Modern Theory of the State*

The origin and development of the state, its sovereignty, its governmental organization and functions. Theories underlying the organization of political parties. *Dr.* DUNNING.

Three hours. Second semester. Preceded in the first semester by 9. Offered if applied for by Graduates.

11, 12. *Current Social and Political Theory and Practice*

A seminary course. Intended to train students in methods of estimating the value and significance of recent publications on social and political topics. Study of current problems arising through changing social conditions. Special attention is given to publications in German and French. *Dr.* DUNNING.

One hour. Through the year. Elective for Graduates and approved Seniors. *Mon. at 5.*

13, 14. *Investigation of Special Topics*

Intended to train students in methods of gathering and presenting data in the study of political problems. In connection with this course, work in comparative legislation may be taken under the direction of the Legislative Reference Bureau of the State Library. *Professor* DEALEY.

Three hours. Six hours of attendance. Through the year. Elective for Graduates, and for a limited number of approved Seniors.

PHYSICAL TRAINING

FREDERICK WILLIAM MARVEL, PH.B., *Professor of Physical Training*

From Thanksgiving to the Spring Recess, all first and second year students are required to attend gymnasium exercises three times a week as follows:

FRESHMEN. *1st div., Tu., Fri., Sat., at 10.20; 2d div., Mon., Tu., Th., at 4.20.*

SOPHOMORES. *1st div., Mon., Wed., Th., at 10.20; 2d div., Tu., Th., Fri., at 3.20.*

A voluntary class for Juniors and Seniors will be held on *Mon., Tu., Th., Fri., at 5.10.* Classes in heavy gymnastics, under the direction of a special instructor, are held four afternoons a week. Classes in wrestling, under the direction of a special instructor, are held two afternoons a week. Instruction in swimming, under the direction of a special instructor, is given by appointment.

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BULLETIN
OF
BROWN UNIVERSITY

ANNOUNCEMENT OF COURSES
1913-1914

WOMEN'S COLLEGE EDITION

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UNIVERSITY OF ILLINOIS

PROVIDENCE
PUBLISHED BY THE UNIVERSITY
[APRIL, MAY, JUNE, OCTOBER, DECEMBER]

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ANNOUNCEMENT OF COURSES
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GENERAL ANNOUNCEMENTS
FOR
THE ACADEMIC YEAR
1913–14

⁂

THE Academic Year begins with chapel service in Pembroke Hall, at 9 a.m., on Wednesday, September 24.

For information regarding Registration and Enrolment of Undergraduates and Graduates, and Requirements for the various Degrees, see pages 6–18 of this Announcement. The following special announcements relate to the Women's College. Undergraduates must register at the Registrar's Office, in Pembroke Hall, between 9 a.m. and 12 m., or between 2 p.m. and 4 p.m., on September 22 and 23. Undergraduates in residence must return their Registration cards to the Registrar not later than June 7. Graduate students register at the office of the Registrar of the University.

COURSES OF INSTRUCTION

WITH the exception of Biology 1, 2, Greek Literature and History 20, and Roman Literature and History 3, courses of instruction are identical with corresponding courses offered to men. Detailed information may be found on pages 18–87. The officers of instruction are those conducting courses for men also, with the addition of:

LIDA SHAW KING, A.M., *Professor of Classical Literature and Archaeology*

FLORENCE HARRIS DANIELSON, A.M., *Instructor in Biology*

*Courses designated by a † are given at the University; women are admitted to them, but only on the recommendation of the Dean of the Women's College. Women may also be admitted to other University courses not announced here, with the special permission of the department and with the consent of the Dean of the Women's College. In courses designated by a * a final mark covering the work of the course as a whole is given at the end of the course, the marks given at the end of the first semester being regarded as temporary.*

Graduate courses are not included in this list, although approved Seniors are admitted to many of them. For Graduate courses, see pages 18–87.

ART

[1, 2. *History of Art from Antiquity through the Renaissance*]

Not offered in 1913–14.

3, 4. *Modern Art, and Theory and Criticism of the Fine Arts*

Professor Poland.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. *Tu., Wed., Sat., at 9.25.*

15,* 16.* *Freehand Drawing*

Training of hand and eye by study in charcoal and pencil of casts and still-life objects.

One hour. Two hours of drawing. Through the year. Elective for Undergraduates. Given at the Rhode Island School of Design. Hours to be arranged with the Director.

17,* 18.* *Advanced Drawing and Color Work*

Practical work in light and shade, and in color.

Three hours. Six hours of drawing, or four hours of drawing and one hour lecture on Historic Ornament. Through the year. Elective for students who have credit for 15, 16, and who have taken or are taking 1, 2. Given at the Rhode Island School of Design. *Mon., Tu., Wed., at 2.* Lecture hour to be arranged by the Rhode Island School of Design.

19,* 20.* *Architectural Design*

Principles of architectural design and composition taught by means of lectures, problems in design, and working drawings.

Three hours. One hour of recitation and four hours of drawing. Through the year. Elective for students who have credit for Mechanical Drawing 3, 4. Given at the Rhode Island School of Design. *Mon. at 3.* Drawing hours to be arranged with the Director.

ASTRONOMY

1, 2. *General Course*

Professor Upton.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for Mathematics 1, 2. *Wed., Fri., Sat., at 11.25.* Observations at Ladd Observatory.

7, 8.† *Advanced Astronomy*

Designed for students who wish to specialize in Astronomy.

Three hours. Through the year. Elective for approved students who have credit for 1, 2. Not given unless elected by four or more students.

BIBLICAL LITERATURE AND HISTORY

1, 2.† *Elementary Hebrew*

Dr. Stern.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

11, 12.† *Gospels and Epistles*

Professor Fowler.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Either semester may be elected independently. *Wed., Fri., Sat., at 11.20.*

[13, 14.† *Acts and Pauline Epistles*]

Not offered in 1913–14.

[15, 16. *Old Testament Literature and History*]

Not offered in 1913–14.

17, 18. *New Testament Literature and History*

Professor Fowler.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. *Tu., Wed., Sat., at 9.25.*

19, 20.† *The English Bible as Literature*

Professor Fowler.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. *Mon., Tu., Th., at 11.20.*

21, 22.*† *Biblical Seminary*

Professor Fowler.

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors who have taken courses in Biblical Literature and History or in Social Science.

BIOLOGY

1, 2. *General Biology*

The structure of animals and plants; elementary vital phenomena; the functions of organs; the development of organisms; classification. An outline of the more important biological theories, such as evolution, natural selection, variation, mutation and heredity, and the principles upon which modern hygiene and sanitation are based. The course will introduce the student to the use of the microscope, laboratory technic, and to scientific methods of observation and experiment.
Miss Danielson.

Three hours. Six hours of attendance. Through the year. Required in Freshman or Sophomore year of candidates for the degree of Bachelor of Philosophy beginning with the class entering in 1911. Elective for Undergraduates. Lectures, *Wed., Fri., Sat., at 11.25.*

3, 4. *Comparative Anatomy of Vertebrates*

Professor Walter.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1, 2. *Tu., Fri., Sat., at 10.25.*

5, 6.† *Anatomy of the Nervous System*

Professor Mead.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2.

7, 8.† *Embryology and Histology*

Professor Mead.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2. *Tu., Th., Sat., at 8.*

9, 10.† *Advanced Histology and Pathology*

Professor Mead.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 1, 2, and 7, 8.

11, 12.† *General Physiology*

Professor MITCHELL.

Three hours. Six hours of attendance. Through the year. Must be preceded by 1, 2, and by Chemistry 1, 2. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon.*, *Tu.*, *Th.*, *at 3.20.*

13, 14.† *Chemical Physiology*

Professor MITCHELL.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for or are taking Chemistry 7, 8. *Tu.*, *Fri.*, *Sat.*, *at 10.20.*

16.† *Bacteriology*

Professor GORHAM.

Three hours. Six hours of attendance. Second semester. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon.*, *Wed.*, *Th.*, *at 10.20.*

17, 18.† *Advanced Bacteriology*

Professor GORHAM.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 16.

20. *Ornithology*

Professor WALTER.

One hour. Two hours of attendance. Second semester. Elective for Undergraduates.

[24.† *Physiology*]

Not offered in 1913–14.

BOTANY

1, 2. *General Course*

Professor YORK.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. *Tu.*, *Wed.*, *Sat.*, *at 9.25.*

3, 4.† *Physiological Anatomy*

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2, or its equivalent.

5, 6.† *Comparative Morphology and Phylogeny*

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2, or its equivalent.

7, 8.† *Advanced Course*

[11, 12.† *Physiology*]

Not offered in 1913–14.

CHEMISTRY

1, 2. *Descriptive Chemistry*

Professor BUCHER *and Mr.* HOLT.

Three hours. Through the year. Elective for Undergraduates. *Tu., Th., Sat., at 12.25*. Laboratory hours to be arranged with the instructor.

3, 4.† *Qualitative and Quantitative Analysis*

Professor APPLETON *and Mr.* CASWELL.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2. *1st div., Fri. at 11.20; 2d div., Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

5, 6.† *Quantitative Analysis, Advanced Course*

Professor APPLETON *and Mr.* CASWELL.

Six hours. Twelve hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3, 4. Laboratory hours to be arranged with the instructor.

7, 8.† *Organic Chemistry*

Professor BUCHER *and Mr.* HOLT.

Six hours. Through the year. Elective for approved Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

10.† *Assaying*

Professor APPLETON *and Mr.* CASWELL.

Six hours. Twelve hours of attendance. Second semester. Elective for Seniors and Graduates who have credit for 1-4.

12.† *Organic Dyes*

Professor APPLETON *and Mr.* CASWELL.

Six hours. Twelve hours of attendance. Second semester. Elective for approved Seniors and Graduates.

15, 16.† *Physical Chemistry*

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

20.† *Inorganic Chemistry, Advanced Course*

Professor Bucher.

Three hours. Second semester. Elective for approved Juniors, Seniors, and Graduates.

21, 22.† *Organic Preparations, Advanced Course*

Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

23, 24.† *Inorganic Preparations, Advanced Course*

Professor Bucher.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 7, 8.

27, 28.† *Conference on Special Topics in Chemistry*

Professor Bucher.

One hour. Through the year. Elective for approved students.

29, 30.† *Conference on Special Topics in Chemistry*

Professor Appleton.

One hour. Through the year. Elective for approved students.

ECONOMICS

1. *Elementary Economics*

Professor Motley.

Three hours. In connection with Social and Political Science 1 constitutes a year course required in Sophomore, Junior, or Senior year of candidates for the degree of Bachelor of Arts. Elective for others. Beginning with the class entering in 1911, required in Sophomore, Junior, or Senior year, of candidates for the degree of Bachelor of Philosophy. First semester. *Tu., Th., Sat., at 12.25.*

5, 6.† *Money and Banking*

Professor Gardner.

Three hours. Two hours of attendance. Through the year. *Wed., Fri., Sat., at 11.20.*

7.† *Socialism and Labor Problems*
Professor Motley.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

10.† *Tariff, Reciprocity, and Shipping Subsidies*
Professor Motley.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

11, 12.† *Public Finance and Financial History*
Professor Gardner.

Three hours. Through the year. *Wed., Fri., Sat., at 11.20.*

[13.† *Statistics*]
Not offered in 1913–14.

[14.† *Accounting*]
Not offered in 1913–14.

15.† *Trade and Transportation*
Professor Motley.

Three hours. First semester. *Mon., Wed., Th., at 10.20.*

16.† *Corporations and Corporation Finance*
Professor Motley.

Three hours. Second semester. *Mon., Wed., Th., at 10.20.*

21, 22.† *Investigation of Special Topics*
Professor Gardner.

Three hours. Six hours of attendance. Through the year. Either semester may be elected independently. Students intending to take either of these courses must secure the permission of the head of the department not later than December 1 or June 1 in the semester preceding that in which they desire to take the course. It is expected that as a rule these courses will be taken in connection with lecture courses. Hours to be arranged with the instructor.

23, 24.† *Economic Seminary*
Professors Gardner *and* Motley.

Three hours. Two hours of attendance. Through the year. Elective for Seniors and Graduates who have taken advanced work in Economics. Hours to be arranged with the instructor.

EDUCATION

1. *History of Education*

Professor JACOBS.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.25.*

2. *Principles of Education*

Professor JACOBS.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.25.*

3. *Psychology of Education*

Professor COLVIN.

Three hours. First semester. Elective for students who have credit for 1 or 2, or who are taking 1, and for Graduates. *Mon., Th., Fri., at 9.25.*

4. *Practical Introduction to Teaching*

Professor COLVIN.

Three hours. Second semester. Elective for students who have credit for or are taking other courses in Education, and for Graduates. *Mon., Th., Fri., at 9.25.*

ENGLISH

1. *Rhetoric and Composition*

Professor HASTINGS, *Messrs.* WILLIAMS *and* ———.

Three hours. First semester. Required of all Freshmen. *1st div., Mon., Th., Fri., at 9.25; 2d div., Tu., Wed., Sat., at 9.25.*

2. *Rhetoric and Composition*

Professor HASTINGS, *Messrs.* WILLIAMS *and* ———.

Three hours. Second semester. Required in the Sophomore year of all candidates for the degree of Bachelor of Arts or Bachelor of Philosophy. *1st div., Tu., Fri., Sat., at 10.25; 2d div., Mon., Tu., Th., at 3.25.*

48. *English Literature from the Beginning to 1798*

Professor HASTINGS, *Messrs.* WILLIAMS *and* ———.

Three hours. Second semester. Required in the Freshman year of all candidates for the degree of Bachelor of Arts or Bachelor of Philosophy. *Mon., Th., Fri., at 9.25.*

5, 6. *English Composition, Advanced Course*

Professor Benedict.

Three hours. Through the year. Elective for Juniors and Seniors. With the consent of the instructor the course may be repeated. *Mon., Wed., Th., at 10.25.*

[7, 8. *Argumentative Composition*]

Not offered in 1913–14.

[11, 12. *Public Speaking*]

Not offered in 1913–14.

15, 16.† *Old English*

Professor Benedict.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 4.20.*

17, 18.† *Chaucer*

Professor Potter.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 3.20.*

21, 22.† *The Drama in England to 1642*

Professor Potter.

Three hours. Two hours of attendance. Through the year. Elective for students who have credit for a year's work in English Literature. In 1913–14 conducted as the Seminary in English Literature.

23, 24. *The Modern English Drama*

Professor Crosby.

Three hours. Through the year. Elective for students who have credit for a year's work in English Literature. *Tu., Fri., Sat., at 10.25.*

25, 26. *Shakspere*

Professor Potter.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Th., Sat., at 12.25.*

[27, 28. *Shakspere*]

Not offered in 1913–14.

[31, 32. *English Literature from 1660 to 1798*]

Not offered in 1913–14.

35. *English Literature from 1798 to 1832, Poetry*

Professor BENEDICT.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. First semester. Elective for Sophomores, Juniors, and Seniors. *Tu., Fri., Sat., at 10.25.*

36. *English Literature from 1798 to 1832, Prose*

Professor BENEDICT.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Second semester. Elective for Sophomores, Juniors, and Seniors. *Tu., Fri., Sat., at 10.25.*

37. *English Literature from 1832 to 1892, Prose*

Professor DAMON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. First semester. Elective for Sophomores, Juniors, and Seniors. *Tu., Th., Sat., at 12.25.*

38. *English Literature from 1832 to 1892, Poetry*

Professor DAMON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Second semester. Elective for Sophomores, Juniors, and Seniors. *Tu., Th., Sat., at 12.25.*

[39, 40. *American Literature*]

Not offered in 1913–14.

[42. *Contemporary English and American Literature*]

Not offered in 1913–14.

[43, 44.† *Seminary in English Literature*]

Not offered in 1913–14.

GEOLOGY

1. *General Geology*

Professor BROWN.

Three hours. First semester. Elective for Undergraduates. *Wed., Fri., Sat., at 11.25.*

6. *Economic Geography and Conservation*

Professor Brown.

Three hours. Second semester. Elective for Undergraduates who have credit for 1 or 5, or who presented Physiography for admission, except Freshmen and Sophomores who are taking another course in the department. *Wed., Fri., Sat., at 11.25.*

9, 10.† *Mineralogy and Petrography*

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Th., at 11.20.*

11, 12.† *Research in Geology and Geography*

One to six hours. Through the year. Elective for Graduates and approved Undergraduates. Either semester may be elected independently.

GERMANIC LANGUAGES AND LITERATURES

1, 2. *Elementary Course, First Year*

Mr. Mitchell.

Three hours. Through the year. Elective for students who did not present German for admission. *Mon., Wed., Fri., at 12.25.*

3, 4. *Elementary Course, Second Year*

Professor Crowell.

Three hours. Through the year. Elective for students who have credit for 1, 2. *Mon., Wed., Fri., at 12.25.*

5, 6. *Intermediate Course*

Mr. Keenan.

Three hours. Through the year. Elective for students who have credit for 3, 4, or for Freshmen who presented elementary German for admission. *Mon., Wed., Fri., at 12.25.*

7, 8. *Advanced Course in Standard Authors, Classical and Modern*

Mr. Bachmann.

Three hours. Through the year. Elective for students who have credit for 3, 4, with rank of B; or for 5, 6; or 9, 10; or who presented advanced German for admission. *Mon., Wed., Fri., at 12.25.*

9, 10.† *Modern Prose*

Professor von Klenze *and Mr.* Mitchell.

Three hours. Through the year. Elective for students who have credit for 5, 6; or who have passed 3, 4, with grade B; or who presented intermediate German for admission. *Tu., Fri., Sat., at 10.20.*

11, 12. *German Lyrical Poetry*

Professor von Klenze.

Three hours. Through the year. Elective for students who have credit for 3, 4, or 7, 8, or 9, 10. *Tu., Wed., Sat., at 9.25.*

[15, 16. *The German Drama of the Nineteenth Century*]

Not offered in 1913–14.

[17, 18.† *Lessing and Schiller*]

Not offered in 1913–14.

25, 26.† *Outline History of German Literature*

Professor von Klenze.

Three hours. Through the year. Elective for students who have credit for 7, 8, or 9, 10. *Tu., Th., Sat., at 12.20.*

[27, 28.† *German Literature in the Nineteenth Century*]

Not offered in 1913–14.

[31.† *Gothic*]

Not offered in 1913–14.

[32.† *Old High German*]

Not offered in 1913–14.

33.† *Old Norse*

Professor Crowell.

Three hours. First semester. Elective for Graduates and approved Undergraduates. *Mon., Tu., Th., at 3.20.*

34.† *Germanic Mythology*

Professor Crowell.

Three hours. Second semester. Elective for Graduates and approved Undergraduates. *Mon., Tu., Th., at 3.20.*

35, 36.† *Middle High German*

Professor von Klenze.

Three hours. Through the year. Elective for Graduates and approved Undergraduates. *Wed., Fri., Sat., at 11.20.*

GREEK LITERATURE AND HISTORY

A, B. *Elementary Course*

Professor Manatt *and* ———.

Three hours. Through the year. Elective for students who did not present elementary and advanced Greek for admission. *Mon., Wed., Fri., at 12.25.*

1. *Homer and the Greek Anthology*

Professor Manatt.

Three hours. First semester. Elective for students who presented elementary and advanced Greek for admission, or who have credit for A, B, and have done the additional work indicated above. *Mon., Tu., Th., at 11.25.*

2. *Lysias and Plato*

Professor Allinson.

Three hours. Second semester. Elective for students who have credit for 1. *Mon., Tu., Th., at 11.25.*

3. *Lucian and the Dramatic Poets*

Professor Allinson.

Three hours. First semester. Elective for Sophomores. *Wed., Fri., Sat., at 11.25.*

4. *The Historians*

Professor Manatt.

Three hours. Second semester. Elective for Sophomores. *Wed., Fri., Sat., at 11.25.*

5. *Epic Poetry*

Professor Manatt.

Three hours. First semester. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.25.*

6. *The Drama*

Professor Allinson.

Three hours. Second semester. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.25.*

[7. *Lyric and Pastoral Poetry*]

Not offered in 1913–14.

[8. *Plato, Aristotle, and Aeschylus*]

Not offered in 1913–14.

[9. *The Attic Orators*]

Not offered in 1913–14.

[10. *Lucian and Pausanias*]

Not offered in 1913–14.

15. *Greek Civilization*

Professor Allinson.

Three hours. Second semester. Required of all candidates for the degree of Bachelor of Philosophy. *Mon., Fri., Sat., at 9.25.*

17, 18.† *Greek Seminary*

Three hours. Two hours of attendance. Through the year. Elective for Graduates and approved Seniors.

20. *Introduction to Greek Archaeology*

Outline of the remains of the earliest Greek civilization; an introductory study of Greek vases, coins, small bronzes, and terra-cotta figurines. Intended to give a general survey of these sources for Greek history and life. Illustrated lectures; collateral reading. *Professor* King.

Three hours. Second semester. Elective for students who have completed one course in Latin or Greek. *Mon., Th., Fri., at 9.25.*

HISTORY

1, 2. *Medieval and Modern History of Europe*

Professor MacDonald.

Three hours. Through the year. Required of candidates for the degree of Bachelor of Arts in the Sophomore or Junior year, and of candidates for the degree of Bachelor of Philosophy in the Freshman, Sophomore, or Junior year. *Mon., Tu., Th., at 11.25.*

3.† *Early and Medieval Christianity*

Professor Collier.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. Introductory to 4. *Tu., Th., Sat., at 12.20.*

4.† *The Reformation*

Professor Collier.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates who have taken 3, and for others by special permission. *Tu., Th., Sat., at 12.20.*

5. *The French Revolution and the Napoleonic Era*

Professor Collier.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. With 6 constitutes a continuous year course in modern European History. *Mon., Tu., Th., at 11.25.*

6. *Europe since 1815*

Professor Collier.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. A continuation of 5, by which it should preferably be preceded. *Mon., Tu., Th., at 11.25.*

[7. *English History, 1066–1689*]

Not offered in 1913–14.

[8. *English History, 1689–1895*]

Not offered in 1913–14.

11, 12.† *Seminary in European History*

Professor Collier.

Three hours. One to two hours of attendance. Through the year. Elective for Graduates and approved Seniors.

13, 14. *American History*

Professor MacDonald.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates, and for Sophomores who have credit for 1, 2. Either semester may be elected independently, but 14 should preferably be preceded by 13. *Tu., Fri., Sat., at 10.25.*

15, 16.† *Constitutional and Political History of the United States*

Professor MacDonald.

Three hours. Two hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates.

17, 18.† *Seminary in American History*

Professor MacDonald.

Three hours. One to two hours of attendance. Through the year. Elective for Graduates and approved Seniors. The course should be preceded by 13, 14, or 15, 16, or 19, 20, but in exceptional cases may be taken by students who at the same time are taking one of these groups of courses.

[19.† *Social History of America to 1800*]
Not offered in 1913–14.

[20.† *History of the United States since 1860*]
Not offered in 1913–14.

MATHEMATICS

INTRODUCTORY STATEMENT

For students who presented only Algebra and Plane Geometry for admission. Candidates for the degree of Bachelor of Arts, and candidates for the degree of Bachelor of Philosophy who do not intend to take Argumentation in the Sophomore year, are required to take one of the following combinations of courses: (A) 1, 2; (B) 3, 4; (C) 3, 2. Students who intend to specialize in Mathematics are advised to take both 1, 2 and 3, 4, or 13, 16, or 17, 18; but if only three hours can be taken in the Freshman year, it is advisable to elect 3, 2.

For students who presented Solid Geometry and Plane Trigonometry for admission. Candidates for the degree of Bachelor of Arts, and those candidates for the degree of Bachelor of Philosophy who do not elect to take Argumentation in the Sophomore year, are required to take one of the following combinations of courses: (A) 3,4; (B) 5,6; (C) 5,4. Students who intend to specialize in Mathematics are advised to take both 3, 4 and 5, 6; but if only one course can be taken in the Freshman year, it is advisable to take 5, 6.

1. *Solid and Spherical Geometry*
Professors Archibald *and* Richardson.

Three hours. First semester. Required as noted in Introductory Statement. Elective for other Undergraduates who did not present Solid Geometry for admission. *Tu., Fri., Sat., at 10.25.*

2. *Plane Trigonometry*
Professors Archibald *and* Richardson.

Three hours. Second semester. Required as noted in Introductory Statement.

Elective for other Undergraduates who did not present Plane Trigonometry for admission. *Tu., Fri., Sat., at 10.25.*

3. *Algebra*

Professor MANNING.

Three hours. First semester. Required as noted in Introductory Statement. Elective for other Undergraduates. *Mon., Wed., Fri., at 12.25.*

4. *Algebra*

Professor MANNING.

Three hours. Second semester. Elective for students who have credit for 3. *Mon., Wed., Fri., at 12.25.*

5. *Plane Analytic Geometry*

Professor DAVIS.

Three hours. First semester. Required as noted in Introductory Statement. Elective for students who have credit for Plane Trigonometry. *Mon., Th., Fri., at 9.25.*

6. *Differential Calculus*

Professor DAVIS.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for students who have credit for 5. *Mon., Th., Fri., at 9.25.*

7, 8.† *Differential and Integral Calculus*

Professor ARCHIBALD.

Three hours. Through the year. Elective for students who have credit for 6. *Tu., Th., Sat., at 12.20.*

9.† *Differential Equations*

Professor MANNING.

Three hours. First semester. Elective for students who have credit for 8 or 20. *Tu., Th., Sat., at 12.20.*

[12.† *Modern Analytic Geometry*]

Not offered in 1913–14.

21, 22.† *Function Theory of a Complex Variable*

Professor MANNING.

Three hours. Through the year. Elective for Graduates and approved Seniors. *Tu., Th., Sat., at 8.*

[25, 26.† *Advanced Algebra*]
Not offered in 1913–14.

[29, 30.† *Function Theory of a Real Variable*]
Not offered in 1913–14.

41, 42.† *Fundamental Problems of Algebra*
Professor Richardson.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon., Wed., Fri., at 8.*

[43, 44. *Foundations, Methods, and Problems of Geometry*]
Not offered in 1913–14.

MUSIC

1, 2. *Evolution of Modern Music*
Professor Macdougall.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. No previous knowledge of music required. *Mon., Wed., at 11.25.*

[3. *Advanced Harmony*]
Not offered in 1913–14.

[4. *The Opera*]
Not offered in 1913–14.

PHILOSOPHY

1, 2. *Logic*
Professor Jones.

Three hours. Through the year. Elective for Sophomores and Juniors. *Tu., Th., Sat., at 12.25.*

3. *Psychology*

A survey of the main facts and laws of mental life, aiming to provide a sound foundation for further acquaintance with this and allied subjects, for an improved judgment in dealing with many practical problems, and for understanding the psychological bases of philosophy.
Professor Delabarre.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Fri., Sat., at 10.25.*

[4. *Ethics*]

Not offered in 1913–14.

5, 6.† *Intermediate Course*

Professor DELABARRE.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for a course in Psychology.

7, 8. *History of Philosophy*

Professor EVERETT.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Wed., Th., at 10.25.*

[9. *Philosophy of Religion*]

Not offered in 1913–14.

10.† *Applications of Psychology*

Professor DELABARRE.

Three hours. Second semester. Elective for students who have credit for 3. *Tu., Wed., Sat., at 9.20.*

11, 12.† *Experimental Psychology, Introductory Laboratory Course*

Professor DELABARRE.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3.

13, 14.† *Problems of Philosophy*

Professor JONES.

Three hours. Through the year. Elective for Juniors and Seniors who have credit for a year course in Philosophy or who are taking 7, 8.

17, 18.† *Psychology, Advanced Course*

Professor DELABARRE.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 5, 6.

19, 20.† *Experimental Psychology, Advanced Laboratory Course*

Professor DELABARRE.

One to six hours. Two to twelve hours of attendance. Through the year. Elective for students who have credit for 11, 12. May be taken for more than six hours by Graduates.

21, 22.† *Advanced Ethics*

Professor Everett.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for a year course in Philosophy.

[23, 24.† *Philosophical Seminary*]

Not offered in 1913–14.

PHYSICS

1, 2. *Elementary Physics*

Professor Barus.

Three hours. Through the year. Elective for Undergraduates who have credit for entrance Algebra and Plane Geometry. *Mon., Tu., Th., at 11.25.*

3, 4.† *Elementary Physics, continued*

Professor Barus.

Three hours. Through the year. Elective for students who have credit for 1, 2, and Mathematics 1, 2. *Tu., Fri., Sat., at 10.20.*

5, 6.† *Experimental Physics*

Professor Palmer.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2.

7, 8.† *Mathematical Treatment of Dynamical Problems*

Professor Palmer.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 5, 6, and Mathematics 9, 10.

9, 10.† *Mathematical Theory of Electricity and Magnetism*

Professor Palmer.

Three hours. Through the year. Elective for Graduates and Seniors who have credit for 5, 6, and Mathematics 9, 10.

11, 12.† *Advanced Laboratory Course*

Professors Barus, Palmer, *and* Watson.

Three or six hours. Six or twelve hours of attendance. Through the year. Elective for students who have credit for 5, 6.

13, 14. † *Applied Harmonic Analysis and Applied Vector Analysis*

Professor BARUS.

Three hours. Through the year. Required in the second semester of candidates for the degree of Bachelor of Science in Electrical Engineering. Elective for Seniors and Graduates who have credit for 1, 2, and Mathematics 7, 8.

15, 16. † *Physics, Advanced Course*

Professor BARUS.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for Mathematics 7, 8.

23, 24. † *Precision Measurements in Photometry, Electricity, and Magnetism*

Professor PALMER.

Four hours. Eight hours in the laboratory. Through the year. Elective for students who have credit for 5, 6, or 21, 22, and Mathematics 7, 8, or 19, 20.

25, 26. † *Radiation, Optics, and Heat*

Professor PALMER.

Three or six hours. Six or twelve hours in the laboratory. Through the year. Elective for students who have credit for 5, 6, or 21, 22.

ROMAN LITERATURE AND HISTORY

1. *Livy*

Professor GREENE.

Three hours. First semester. Elective for students who presented elementary and advanced Latin for admission. *Mon., Tu., Th., at 2.25.*

2. *Cicero's Letters*

Professor GREENE.

Three hours. Second semester. Elective for students who presented elementary and advanced Latin for admission. *Mon., Tu., Th., at 2.25.*

3. *Catullus and Virgil*

Professor KING.

Three hours. First semester. Elective for Sophomores. *Mon., Wed., Th., at 10.25.*

4. *Horace's Satires, Juvenal*

Professor HARKNESS.

Three hours. Second semester. Elective for Sophomores. *Mon., Wed., Th., at 10.25.*

5, 6. *Latin Poetry*

Professors HARKNESS *and* GREENE.

Three hours. Through the year. Elective for Juniors and Seniors. Either semester may be elected independently. *Tu., Th., Sat., at 12.25.*

[7, 8. *Latin Prose*]

Not offered in 1913–14.

[11, 12. *Latin Composition*]

Not offered in 1913–14.

16. *Roman Civilization*

Professor GREENE.

Three hours. First semester. Required in the Freshman or Sophomore year of candidates for the degree of Bachelor of Philosophy. *Mon., Th., Fri., at 9.25.*

ROMANCE LANGUAGES AND LITERATURES

1, 2. *Elementary Course, First Year*

Mr. MICOLEAU.

Three hours. Through the year. Elective for students who did not present French for admission. *Mon., Wed., Th., at 10.25.*

5, 6. *Intermediate Course*

Professor HUNKINS.

Three hours. Through the year. Elective for students who have credit for 3, 4, or who presented elementary French for admission. *Mon., Wed., Th., at 10.25.*

7, 8. *Advanced Course*

Professor JOHNSON.

Three hours. Through the year. Elective for students who have credit for 5, 6, or who presented advanced French for admission. *Tu., Wed., Sat., at 9.25.*

9, 10.† *The Realistic School*

Professor HUNKINS.

Three hours. Through the year. Elective for students who have credit for 7, 8. *Tu., Fri., Sat., at 10.20.*

[11, 12. *The Romantic School*]

Not offered in 1913–14.

13, 14. *The Classical School*

Professor Langdon.

Three hours. Through the year. Elective for students who have credit for 9, 10, or 11, 12, and for approved students who have credit for 7, 8. *Tu., Wed., Sat., at 9.25.*

15, 16.† *Modern Spanish*

Professor Johnson.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern language. *Tu., Fri., Sat., at 10.20.*

17, 18.† *Modern Italian*

Professor Langdon.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern language. *Mon., Th., Fri., at 9.20.*

19, 20. *Dante in English*

Professor Langdon.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Students are advised to elect this course in their Senior year. *Wed., Fri., Sat., at 11.25.*

21, 22.† *Spanish Language and Literature*

Professor Johnson.

Three hours. Through the year. Elective for students who have credit for 15, 16. *Mon., Th., Fri., at 9.20.*

23, 24. *Practice in Writing and Speaking French*

Professor Johnson.

Three hours. Through the year. Elective for students who have credit for 7, 8. *Mon., Wed., Th., at 10.25.*

SOCIAL AND POLITICAL SCIENCE

SOCIAL SCIENCE

1. *Elementary Social and Political Science*
Professor Dealey.

Three hours. In connection with Economics 1 constitutes a year course required in Sophomore, Junior, or Senior year of candidates for the degree of Bachelor of Arts and Bachelor of Philosophy. Elective for others. Second semester. *Tu., Th., Sat., at 12.25.*

3, 4. *Social Problems and Conditions*
Professor ———.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.25.*

7, 8.† *Sociology as a Science*

Three hours. Through the year. Elective for Seniors and Graduates. *Wed., Fri., Sat., at 11.20.*

11, 12.† *Sociological Theories*
Professor Dealey.

Three hours. Through the year. Offered if applied for by Graduates.

13, 14.† *Investigation of Special Topics*

Three hours. Six hours of attendance. Through the year. Elective for Graduates, and for a limited number of approved Juniors and Seniors. Either semester may be elected independently.

POLITICAL SCIENCE

1. *Elementary Political and Social Science*
See Social Science 1.

3, 4. *Government and Politics of the United States*
Dr. Dunning.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.25.*

13, 14.† *Investigation of Special Topics*

Three hours. Five hours of investigation and one hour of classroom work each week. Through the year. Elective for Graduates, and for a limited number of approved Seniors. *Mon., 5 to 6.*

HYGIENE AND PHYSICAL EDUCATION

M. ELIZABETH BATES, *Instructor*

From Thanksgiving until the Spring recess, first and second year students are required to attend classes in the gymnasium three times a week. Seniors and Juniors may elect one, two, or three hours. In the fall and spring all students may take athletics. Students are carefully examined before exercise is assigned.

FRESHMAN CLASS. Gymnastics, games, dancing, and conferences in practical hygiene. Three hours. *Mon., Tu., Th., 3.30 to 4.15.*

SOPHOMORE CLASS. Gymnastics, games, dancing, and conferences in practical hygiene. More advanced than Freshman work. Three hours. *Mon., Tu., Th., 2.30 to 3.15.*

SENIOR AND JUNIOR ELECTIVE CLASS. Similar to the required work, but more advanced. One or two hours. *Tu., 4.30 to 5.15; Fri., 2.30 to 3.15.*

PLAY COURSE. Play, games, and folk dances suitable for elementary schools, playgrounds, and social settlements. Elective. One hour. *Fri., 3.30 to 4.15.*

RESTRICTED EXERCISE. Restricted gymnastics, games, and dancing will be offered to students who, because of their organic condition, or of temporary disability, are unable to take the regular class work.

REST AND HYGIENE READING. Students who are not able to take the required exercise in the gymnasium will be assigned to the rest room as a substitute. They will also do prescribed reading in personal hygiene and have conferences in hygiene with the instructor.

REMEDIAL EXERCISE. Special remedial work will be given to students who have round shoulders, lateral curvature of a functional nature, or flat foot.

ATHLETICS. All students are offered basket ball, tennis, and bowling under the supervision of the instructor during the entire year.

ANNOUNCEMENT OF COURSES
OFFERED IN
BROWN UNIVERSITY
1913-1914

PROVIDENCE, RHODE ISLAND
PUBLISHED BY THE UNIVERSITY
1913

CALENDAR 1913–1914

Vacations and holidays occurring within the academic year 1913–14 are indicated by dark type.

1913

JULY

S	M	T	W	T	F	S
..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	..	..

AUG.

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17	18	19	20	21	22	23
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31	..	..	..	..	..	..

SEPT.

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OCT.

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NOV.

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DEC.

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28	**29**	**30**	**31**	..	..	..

1914

JAN.

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18	19	20	21	22	23	24
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FEB.

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22	**23**	24	25	26	27	28

MAR.

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APR.

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19	20	21	22	23	24	25
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MAY

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31	..	..	..	..	..	..

JUNE

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1914

JULY

S	M	T	W	T	F	S
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AUG.

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SEPT.

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OCT.

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NOV.

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DEC.

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13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	..	..

THE UNIVERSITY CALENDAR 1913–14

1913	
September 3.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
September 17–22.	*Wednesday, Thursday, Friday, Saturday, and Monday.* Examinations for admission to the Freshman class and to advanced standing.
September 22, 23.	*Monday and Tuesday.* Registration of new students and enrolment of students previously in residence.
September 24.	*Wednesday.* Academic Year begins (fourth Wednesday in September). Registration of Graduate students.
October 4.	*Saturday.* Examination in Greek for the President's Premiums, 5 Maxcy Hall, 2.30 p.m.
October 8.	*Wednesday.* Examination in Latin for the President's Premiums, 1 Sayles Hall, 2.30 p.m.
October 11.	*Saturday.* Examination in Mathematics for the Hartshorn Premiums, 27 Wilson Hall, 2 p.m.
October 15.	*Wednesday.* Examination in French for the Hicks Premiums, 1 Sayles Hall, 2.30 p.m.
October 18.	*Saturday.* Examination in German for the Hicks Premiums, 5 Sayles Hall, 2.30 p.m.
November 27.	*Thursday.* Thanksgiving Day. No University exercises.
December 3.	*Wednesday.* Preliminary discussion for the Class of 1880 Prizes.
December 5.	*Friday.* Last day for receiving essays submitted in competition for the Class of 1880 Prizes.
December 10.	*Wednesday.* Public discussion for the Class of 1880 Prizes.
Dec. 22, 1913, *to* Jan. 1, 1914.	*Monday to Thursday inclusive.* Christmas Recess.

1914

JAN. 26 *to* FEB. 5.	*Monday to Thursday.* Semester examinations.
FEBRUARY 2.	*Monday.* Last day for applications of competitors for the Carpenter Prizes in Elocution.
FEBRUARY 6–10.	*Friday to Tuesday inclusive.* MID-YEAR RECESS.
FEBRUARY 9, 10.	*Monday and Tuesday.* Enrolment of Undergraduate students.
FEBRUARY 11.	*Wednesday.* SECOND SEMESTER BEGINS. Enrolment of Graduate students.
FEBRUARY 23.	*Monday.* Observed as Washington's Birthday. No University exercises.
MARCH 2.	*Monday.* Last day for applications of competitors for the Bishop McVickar Prizes.
MARCH 25.	*Wednesday.* Last day for receiving essays submitted in competition for the Gaston Prize Medal.
APRIL 1.	*Wednesday.* Last day for receiving applications for examination for the degree of Doctor of Philosophy, or of Master of Arts *in absentia.*
APRIL 2–8.	*Thursday to Wednesday inclusive.* SPRING RECESS.
APRIL 15.	*Wednesday.* Last day for receiving applications for the Grand Army of the Republic Fellowship.
APRIL 28.	*Tuesday.* Carpenter Prize Speaking Competition.
APRIL 30.	*Thursday.* Last day for receiving theses of candidates for the degree of Doctor of Philosophy.
MAY 2.	*Saturday.* Last day for receiving essays submitted in competition for the Bishop McVickar Prizes.
MAY 5.	*Tuesday.* Gaston Prize Medal Competition.
MAY 12.	*Tuesday.* Hicks Prize Debate.
MAY 29.	*Friday.* Last day for examinations for advanced degrees.
MAY 30.	*Saturday.* Memorial Day. No University exercises.
JUNE 2–12.	*Tuesday to Friday.* Semester examinations.

June 14.	*Sunday.* Baccalaureate Sermon, First Baptist Meeting House, 4.30 p.m.
June 15.	*Monday.* Class Day.
June 16.	*Tuesday.* Annual Meeting of the Phi Beta Kappa Society, Administration Building, 9.30 a.m. Ivy Day, Pembroke Hall. Annual Meeting of the Associated Alumni, Lyman Gymnasium, 7 p.m.
June 17.	*Wednesday.* One Hundred and Forty-Sixth Annual Commencement (third Wednesday in June), First Baptist Meeting House, 10 a.m.
June 18.	*Thursday.* Meeting of the Corporation.
June 18 *to* Sept. 22.	Summer Vacation.
September 2.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
September 16–21.	*Wednesday, Thursday, Friday, Saturday, and Monday.* Examinations for admission to the Freshman class and to advanced standing.
September 21, 22.	*Monday and Tuesday.* Registration of new students and enrolment of students previously in residence.
September 23.	*Wednesday.* Academic Year begins (fourth Wednesday in September).

REGISTRATION AND ENROLMENT

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REGISTRATION AND ENROLMENT OF UNDERGRADUATES

BEFORE filing their registration cards at the office, members of the class of 1915 who are candidates for the degree of Bachelor of Philosophy must comply with the Requirements for Concentration. See pages 12-14.

REGISTRATION. In September all new students, whether candidates for a degree or special students, must report at the Administration Building between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first semester, and fill out registration cards for the whole of the ensuing year. Failure to comply with this rule will be treated as late registration and a fee of three dollars will be charged. All new students must present at or before the time of registration all credentials necessary for admission as candidates for a degree or as special students.

In May of each year all undergraduates in residence, whether candidates for a degree or special students, must obtain at the Registrar's office registration cards, which must be filled out with a statement of the courses elected for the whole of the ensuing year, and returned not later than June 1. Failure to comply with this rule will be treated as late registration and a fee of three dollars will be charged.

When semester courses are grouped in one paragraph (*e.g.* Botany 1, 2), the second semester may not be taken without the first, unless specific statement to the contrary is made. In starred courses a final mark will be given at the end of the course, the mark given at the end of the first semester being regarded as temporary. Changes in registration will be allowed only on presentation of sufficient reasons to the Committee on Registration and Attendance. Requests for permission to make changes in September must be presented to the committee between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first semester. Requests for permission to make changes for the second semester must be presented to the committee before the beginning of the examinations of the first semester, unless these requests are the result of failures, in which case they must be presented in writing to the Registrar two days before the opening of the second semester.

ENROLMENT. All students must report at the Registrar's office between 9 a.m. and 5 p.m. on one of the two days preceding the opening of each semester and have their names checked as enrolled. Failure to report will be treated as late enrolment and a fee of three dollars will be charged.

GRADUATE STUDENTS

Graduate students must report to the Dean of the Graduate Department in No. 5 Wilson Hall between 9 a.m. and 1 p.m. or between 3 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of each semester. Before entering classes they must present their registration cards at the Registrar's office and be enrolled.

UNIVERSITY FEES

FEES FOR UNDERGRADUATES. *Tuition:* $52.50 a semester; $105 a year. *Incidentals:* $24 a semester; $48 a year. *Matriculation fee* (Freshman year only): $5. *Graduation fee* (Senior year only): $8.

The incidental expenses are for the printing of programs, examination papers, and the like, the use of the library and the gymnasium, heat for these buildings and for the recitation rooms, and the wages of servants to care for them.

Special students who are taking courses amounting to less than fifteen hours a week pay in proportion to the actual amount taken.

FEES FOR RESIDENT GRADUATE STUDENTS. *Tuition:* $75 a semester; $150 a year. *Graduation fee:* for the degree of Master of Arts, $15; for the degree of Master of Science, $15; for the degree of Doctor of Philosophy, $25.

Graduate students who are taking courses amounting to less than fifteen hours a week pay $15 a semester for each three-hour course.

A candidate in residence for the degree of Master of Arts or Master of Science who has paid full tuition for one year may, if necessary to the attainment of his degree, continue his studies for one year more without additional charge.

A candidate in residence for the degree of Master of Arts, who without remitting his studies becomes a candidate for the degree of Doctor of Philosophy, is credited with whatever tuition he has already paid, in case his previous work is allowed to count toward the higher degree.

A candidate for the degree of Doctor of Philosophy who has paid full tuition for two years may, if necessary to the attainment of his degree, continue his studies for two years more without additional charge.

FEES FOR NON-RESIDENT GRADUATE STUDENTS. *Registration fee:* $25. *Tuition:* $15 a semester; $30 a year. *Examination fee:* $15.

A non-resident candidate is entitled, upon payment of the registration and tuition fees, to take one three-hour course in residence. For each additional course taken in residence a fee of $15 a semester is charged.

A non-resident candidate who has paid tuition for two years may, if necessary to the attainment of his degree, continue his studies for one year more without additional charge, except for work taken at the University.

LABORATORY FEES. In addition to the regular fees mentioned above, the following fees are charged for laboratory courses. $4.50 for each three-hour semester course in *Botany, Biology, Geology, Elementary Chemistry.* $7.50 for each three-hour semester course in *Advanced Chemistry, Mechanical Engineering, Physics, Electrical Engineering.* These fees cover the cost of ordinary supplies; special supplies and breakage are charged extra.

SPECIAL FEES. Candidates for a first degree who do not pay four years full tuition fees must pay for all extra courses counted toward the degree at the rate of $7.50 per semester for each three-hour course. This amount must be paid at the beginning of the semester preceding the completion of the degree work. This rule does not apply to courses credited from other institutions or taken during the summer.

Candidates for the degree of A.M. or Sc.M. who do not pay full tuition fees for one year, and candidates for the degree of Ph.D. who do not pay full tuition fees for two years, must pay for all extra courses counted toward the degree at the rate of $7.50 per semester for each three-hour course. This amount must be paid at the beginning of the semester preceding the completion of the degree work. This rule does not apply to courses credited from other institutions.

PAYMENT OF UNIVERSITY BILLS

Every student, graduate or undergraduate, must pay in advance, at registration for each semester, all charges for tuition and incidentals for such semester.

Students occupying dormitory rooms must also pay at the above time all room charges for the semester.

Students taking laboratory courses must also pay at the above time all laboratory fees for the semester. These fees vary from $4.50 to $7.50 for each three-hour laboratory course.

At the beginning of the second semester all students occupying dormitory rooms or taking laboratory courses must, in addition to the payment of the above amounts, make a deposit of $5 toward charges for light or breakage during that semester.

Freshmen, candidates for degrees, must pay at registration for the first semester a matriculation fee of $5.

Candidates for graduation in any year must pay all graduation fees at the beginning of the second semester of that year.

REQUIREMENTS FOR DEGREES

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REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ARTS

I. PRESCRIBED SUBJECTS

Ancient Languages (either Latin or Greek, or both). Six hours. At least three hours must be taken in the Freshman year, and the six hours must be completed by the end of the Sophomore year.

Modern Languages (either French or German, or both). Six hours. Either in French or in German the equivalent of the elementary and intermediate requirement for admission must be taken, or such portion of this requirement as was not presented for admission, and one three-hour year course in addition in the same language. At least three hours must be taken in the Freshman year.

Mathematics. Three hours. Freshman year.

English (*Rhetoric and Composition*). Three hours. First semester, Freshman year. Three hours. Second semester, Sophomore year.

English Literature. Three hours. Second semester, Freshman year. First semester, Sophomore year.

European History. Three hours. Sophomore or Junior year.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Social and Political Science, and Economics. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. Required Studies. *Latin* or *Greek*, three hours; *French* or *German*, three hours; *Mathematics*, three hours; *English*, three hours.

II. Elective Studies. One three-hour course continuous through the year must be chosen from the following list: *Latin*, *Greek*, *French*, *German*, *Chemistry*, *Botany*, *Biology*, *Geology*, *Mechanical Drawing*.

SOPHOMORE YEAR

That portion of the required work in ancient and modern languages not completed in the Freshman year, and other required and elective courses sufficient to make a total of fifteen hours a week.

JUNIOR YEAR

The required History and Physical or Natural Science, if not previously taken, and other required and elective courses sufficient to make a total of fifteen hours a week.

SENIOR YEAR

All required courses not previously taken, and elective courses sufficient to make a total of fifteen hours a week.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF PHILOSOPHY ‡

For Students who entered before 1911

I. PRESCRIBED SUBJECTS

Modern Languages. An amount sufficient, with the work presented for admission, to complete the elementary course and a year of advanced work in both French and German. A student who is admitted in both advanced French and advanced German must continue one of these languages for one year, three hours a week.

Mathematics. Three hours. Freshman year.

English (*Rhetoric and Composition*). Three hours. Freshman year.

European History. Three hours. Sophomore or Junior year.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year.

II. REQUIREMENTS ARRANGED BY YEARS

SOPHOMORE YEAR

That portion of the required work in modern languages not completed in the Freshman year, and other required and elective courses sufficient to make a total of fifteen hours a week.

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‡ Candidates for the degree of Bachelor of Philosophy who entered before 1911 may take advantage of the new Requirements for Concentration, may substitute the new for the old requirements in Modern Languages, and, with the consent of the departments concerned, may substitute a course in Argumentation for the required Mathematics. See pages 11-14.

JUNIOR YEAR

The required History and Physical or Natural Science, if not previously taken, and other required and elective courses sufficient to make a total of fifteen hours a week.

SENIOR YEAR

All required courses not previously taken, and elective courses sufficient to make a total of fifteen hours a week.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF PHILOSOPHY

FOR STUDENTS ENTERING AFTER 1910

I. PRESCRIBED SUBJECTS

A continuous course of three hours through the year in each of the following subjects:

Mathematics. This subject may be omitted by students who intend to take Argumentation in the Sophomore year. Freshman year.

English (*Rhetoric and Composition*). First semester, Freshman year. Second semester, Sophmore year.

English Literature. Second semester, Freshman year. First semester, Sophomore year.

French or *German.* Either in French or in German the equivalent of the elementary and intermediate requirement for admission must be taken, or such portion of this requirement as was not presented for admission, and one three-hour year course in addition in the same language. At least three hours must be taken in the Freshman year.

Biology. Freshman or Sophomore year.

Physics, *Chemistry*, *Geology*, or *Astronomy.* This requirement does not apply to students who presented Physics and Chemistry for admission. *Chemistry*, or *Geology*, or *Physics*, Freshman or Sophomore year. *Astronomy*, Sophomore year. Only one of this group required.

Classical Civilization. Freshman or Sophomore year. Freshman year for students who do not take Mathematics.

European History. Freshman, Sophomore, or Junior year.

Philosophy. Sophomore, Junior, or Senior year.

Social and Political Science, and Economics. Sophomore, Junior, or Senior year.

Argumentation (for students who did not take Mathematics). Sophomore year.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. Required Studies. *English*, *French*, or *German* (a course in continuation of a course presented for admission); *Mathematics* (for students who do not intend to take Argumentation in the Sophomore year); *Classical Civilization* (for students who do not take Mathematics); *Biology*, *Chemistry*, *Geology*, or *Physics*.

II. Elective Studies. One three-hour course continuous through the year must be chosen from the following list: *Latin*, *Greek*, *French*, *German*, *Classical Civilization*, *History*, *Chemistry*, *Botany*, *Biology*, *Geology*, *Mechanical Drawing*.

SOPHOMORE YEAR

That portion of the required work in modern languages not completed in the Freshman year.

Biology; for students who did not take this course in the Freshman year.

Physics, *Chemistry*, *Astronomy*, or *Geology;* for students who did not present Physics and Chemistry for admission or take a course in Physical Science in the Freshman year.

Argumentation; for students who did not take Mathematics in the Freshman year.

Classical Civilization; for students who did not take this subject in the Freshman year.

English.

Other required and elective courses sufficient to make a total of fifteen hours a week.

JUNIOR YEAR

The required History, if not previously taken, and other required and elective courses sufficient to make a total of fifteen hours a week.

During the Junior and Senior years a student must take at least four courses outside the department chosen for special work. See Requirements for Concentration, below.

SENIOR YEAR

All required courses not previously taken, and elective courses sufficient to make a total of fifteen hours a week.

III. REQUIREMENTS FOR CONCENTRATION

At the close of the Sophomore year each candidate for the degree of Bachelor of Philosophy must choose from the following list a department in which he intends to do special work during the Junior and Senior years, and must elect at least three courses of three hours a year each in this department. If he has not already taken a three-hour year course in the department chosen, he must elect four courses.

These courses must be selected in consultation with the head of the department and must be approved by him. When two departments are combined, the selection must be made in consultation with the head of the department first named.

At any time before the beginning of the Senior year a student may, with the approval of the Committee on Registration and Attendance, change the department in which he is to do his special work.

With the approval of the department in which the student is doing special work, he may count as the equivalent of one course, work which does not require regular class-room attendance.

LIST OF DEPARTMENTS IN WHICH SPECIAL WORK MAY BE TAKEN

Art.
Art, and Greek Literature and History.
Art, and Roman Literature and History.
Art, and Music.
Art, and History.
Astronomy.
Astronomy, and Civil Engineering.
Astronomy, and Physics.
Astronomy, and Mathematics.
Astronomy, and Geology.
Biblical Literature and History.
Biblical Literature and History, and Greek Literature and History.
Biblical Literature and History, and Philosophy.
Biology.
Botany.
Botany, and Biology.
Chemistry.
Civil Engineering.
Economics.
Education.
Education, and Philosophy.
Education, and Social and Political Science.
Education, and History.
Electrical Engineering.
English.
Geology.
Germanic Languages and Literatures.

Greek Literature and History.
Greek Literature and History, and Roman Literature and History.
Greek Literature and History, and Biblical Literature and History.
Greek Literature and History, and Indo-European Philology.
Greek Literature and History, and Art.
History.
Mathematics.
Mechanical Engineering.
Mechanics and Mechanical Drawing.
Mechanics, and any Engineering department.
Philosophy.
Physics (exclusive of Electrical Engineering).
Roman Literature and History.
Roman Literature and History, and Art.
Roman Literature and History, and Greek Literature and History.
Roman Literature and History, and Indo-European Philology.
Romance Languages and Literatures.
Social and Political Science.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN CIVIL ENGINEERING

FRESHMAN YEAR

First Semester	*Second Semester*
Mathematics 17	Mathematics 18
Mech. Drawing 1	Mech. Drawing 2
English 1	English 2

and two of the following courses, Chemistry (if not presented for admission), French, German, subject to the direction of the Committee on Registration and Attendance.

NOTE. A student who presents three units in one foreign language for admission is not required to take a course in that language in college, but may elect any course he desires, subject to the approval of the head of the Department of Civil Engineering.

SOPHOMORE YEAR

Mathematics 19	Mathematics 20
Mech. Drawing 3	Mech. Drawing 4
Civil Engineering 1	Civil Engineering 2
Physics 1	Physics 2

First Semester	*Second Semester*
‡Economics 1	‡Soc. and Pol. Science 1
	§Civil Engineering 4
	Civil Engineering 6

JUNIOR YEAR

Civil Engineering 7	Civil Engineering 8
Mechanics 1	Mechanics 2
Geology 3	Geology 4
Physics 21	Physics 22
Mech. Engineering 19	Mech. Engineering 20
Astronomy 5	Civil Engineering 10
	Civil Engineering 12

SENIOR YEAR

Civil Engineering 9	Civil Engineering 20
Civil Engineering 13	Civil Engineering 22
Civil Engineering 15	Civil Engineering 24
Civil Engineering 17	Civil Engineering 26
Civil Engineering 19	Civil Engineering 28
Civil Engineering 35	Civil Engineering 30
Elect. Engineering 1	Civil Engineering 32
	Civil Engineering 34
	Civil Engineering 36
	Mech. Engineering 24
Mechanics 3	Mechanics 4

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

FRESHMAN YEAR

First Semester	*Second Semester*
Mathematics 17	Mathematics 18
Mech. Drawing 1	Mech. Drawing 2
English 1	English 2

and two of the following courses, Chemistry (if not presented for admission), French, German, subject to the direction of the Committee on Registration and Attendance.

Note. A student who presents three units in one foreign language for admission is not required to take a course in that language in college, but may elect any course he desires, subject to the approval of the head of the Department of Electrical Engineering.

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‡ Or some other year course in the Department of English, or History, or Philosophy, chosen with the approval of the head of the Department of Civil Engineering.

§ Civil Engineering 4 is taken during the spring recess.

SOPHOMORE YEAR

First Semester	*Second Semester*
Mathematics 19	Mathematics 20
Mech. Drawing 3	Mech. Drawing 4
Mech. Drawing 5	Mech. Engineering 8
Physics 1	Physics 2
‡ Economics 1	‡ Soc. and Pol. Science 1
Mech. Engineering 1	Mech. Engineering 2

JUNIOR YEAR

Mechanics 1	Mechanics 2
Mech. Engineering 9	Mech. Engineering 10
Physics 21	Physics 22
Elect. Engineering 1	Elect. Engineering 2
Mech. Engineering 3	Elect. Engineering 6
Mech. Engineering 19	Mech. Engineering 20

SENIOR YEAR

Mechanics 3	Mechanics 4
Mathematics 9a	Elect. Engineering 12
	Elect. Engineering 10
Physics 23	Physics 14
Elect. Engineering 3	Elect. Engineering 14
Elect. Engineering 7	Elect. Engineering 18
Mech. Engineering 15	Mech. Engineering 16
	Civil Engineering 26
Elect. Engineering 13	Elect. Engineering 14
	Mech. Engineering 24

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

FRESHMAN YEAR

First Semester	*Second Semester*
Mathematics 17	Mathematics 18
Mech. Drawing 1	Mech. Drawing 2
English 1	English 2

and two of the following courses, Chemistry (if not presented for admission),

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‡ Or some other year course, not technical, chosen with the approval of the head of the Department of Electrical Engineering.

French, German, subject to the direction of the Committee on Registration and Attendance.

Note. A student who presents three units in one foreign language for admission is not required to take a course in that language in college, but may elect any course he desires, subject to the approval of the head of the Department of Mechanical Engineering.

SOPHOMORE YEAR

First Semester	*Second Semester*
Mathematics 19	Mathematics 20
Mech. Drawing 3	Mech. Drawing 4
Mech. Drawing 5	Mech. Engineering 8
Physics 1	Physics 2
‡Economics 1	‡Soc. and Pol. Science 1
Mech. Engineering 1	Mech. Engineering 2

JUNIOR YEAR

Mech. Engineering 19	Mech. Engineering 20
Mech. Engineering 15	Mech. Engineering 16
Mech. Engineering 3	Mech. Engineering 4
Mech. Engineering 9	Mech. Engineering 10
Mechanics 1	Mechanics 2
Physics 21	Physics 22

SENIOR YEAR

Mech. Engineering 21	Mech. Engineering 22
Mech. Engineering 5	Mech. Engineering 14
Mech. Engineering 17	Mech. Engineering 18
Mechanics 3	Mechanics 4
Elect. Engineering 1	Elect. Engineering 2
Mech. Engineering 11	Mech. Engineering 12
	Mech. Engineering 24
Mech. Engineering 25	Mech. Engineering 26
	Civil Engineering 26

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‡Or some other year course in the Department of English, or History, or Philosophy, chosen with the approval of the head of the Department of Mechanical Engineering.

COURSES OF INSTRUCTION

WHEN semester courses are grouped in one paragraph (e.g. *Biology 1, 2*), *the second semester may not be taken without the first unless specific statement to the contrary is made. In starred courses a final mark covering the work of the course as a whole is given at the end of the course, the marks given at the end of the first semester being regarded as temporary. When the time of meeting is not announced, it will be arranged by the instructor at the beginning of the semester.*

I. ART‡

WILLIAM CAREY POLAND, A.M., LITT.D., *Professor of the History of Art*

1, 2. *History of Art from Antiquity through the Renaissance*

First semester, ancient art, chiefly Greek and Roman. Second semester, Early Christian, Byzantine, Romanesque, and Gothic art, and the art of the fifteenth and sixteenth centuries; the effect on art of the dominant motives of the epoch, the development of art in the different countries of Europe, the great masters and their most significant works. Text-book, lectures, lantern views. Students who elect this course are advised to elect also, if possible, courses 17, 18, *Advanced Drawing and Color Work.*

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. *Mon., Wed., Th., at 10.20.*

3, 4. *Modern Art, and Theory and Criticism of the Fine Arts*

First semester, the seventeenth and eighteenth centuries. Second semester, the nineteenth century, with a study of the more important facts and laws of artistic production. Text-book, lectures, special assigned topics, lantern views.

Three hours. Through the year. Course 3 is elective for students who have completed 2. Course 4 is elective for students who have completed 1, or 2, or 3. *Mon., Th., Fri., at 9.20.*

5,* 6.* *Renaissance Art, Advanced Course*

Critical study of the art of the fifteenth and sixteenth centuries, particularly Italian. A more detailed study of the spiritual conditions, the influences, and the masters, than in 2.

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‡ For arrangements with the Rhode Island School of Design, see the Catalogue, page 166.

Three hours. Through the year. Elective by written consent of the instructor, for students who have credit for 2. *Tu., Th., Sat., at 12.20.*

7, 8. *Seminary in Greek and Roman Sculpture*

An archaeological course based on Overbeck's *Schriftquellen.*

Three hours. Through the year. Elective for Graduates who read Greek and Latin. It is advised that application be made to Professor Poland at an early date.

[9. *Seminary Study of the Acropolis of Athens*]

Critical reading, in Greek, of Pausanias' account of the Acropolis of Athens; lectures and illustrations.

Three hours. First semester. Elective for Graduates who read Greek and Latin. Not offered in 1913–14.

[10. *Seminary in Classical Architecture*]

Critical study; reading of Vitruvius in Latin; discussion of the principles followed by the Greek and Roman architects, and of the influence of Vitruvius upon the Renaissance.

Three hours. Second semester. Elective for Graduates. Offered if three or more elect the course. Not offered in 1913–14.

15,* 16.* *Freehand Drawing*

Training of hand and eye by study in charcoal and pencil of casts and still-life objects.

One hour. Two hours of drawing. Through the year. Elective for Undergraduates. Given at the Rhode Island School of Design. Hours to be arranged with the Director.

17,* 18.* *Advanced Drawing and Color Work*

Practical work in light and shade, and in color.

Three hours. Six hours of drawing, or four hours of drawing and one hour lecture on Historic Ornament. Through the year. Elective for students who have credit for or are taking 1, 2, and who have credit for 15, 16. Given at the Rhode Island School of Design. *Mon., Tu., Wed., at 2.* Lecture hour to be arranged with the Director.

II. ASTRONOMY

Winslow Upton, A.M., Sc.D., *Professor of Astronomy*
John Edwards, *Assistant in the Ladd Observatory*

1, 2. *General Course*

Designed for general culture and preparation for technical work. Fundamental conceptions; methods of professional study. First semester, chief topic: the movements of the heavenly bodies. Second semester, chief topics: the physical condition of the heavenly bodies; the sidereal universe.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for Mathematics 1, 2. *Mon., Wed., Th., at 10.20.* Observations at Ladd Observatory.

5. *Field Astronomy*

The astronomical problems of geodesy: azimuth, time, latitude, longitude. Computations and observations.

Four hours. First semester. Required of candidates for the degree of Bachelor of Science in Civil Engineering. Elective for Juniors and Seniors who have credit for Mathematics 1, 2. *Mon., Tu., Th., Fri., at 2.20.* Observations at Ladd Observatory.

7, 8. *Advanced Astronomy*

Designed for students who wish to specialize in Astronomy.

Three hours. Through the year. Elective for approved students who have credit for 1, 2. Not given unless elected by four or more students.

9, 10. *Research Course*

Special advanced work. Subjects arranged to meet the requirements of individual students.

Elective for Graduates and approved Undergraduates.

III. BIBLICAL LITERATURE AND HISTORY‡

HENRY THATCHER FOWLER, PH.D., *Professor of Biblical Literature and History*

NATHAN STERN, PH.D., *Lecturer in Biblical Literature and History*

LANGUAGES

1, 2. *Elementary Hebrew*

Grammar; exercises in writing Hebrew; translation of parts of Genesis and Deuteronomy. *Dr.* STERN.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

3, 4. *Historical Hebrew*

Reading of the books of Samuel and Kings with special attention to the acquisition of a vocabulary; review of the elements of Hebrew grammar and study of syntax. *Dr.* STERN.

Three hours. Through the year. Elective for students who have credit for 1.

5, 6. *Hebrew Literature*

Prophetic literature. Critical translation of the Wisdom writings of the Old Testament; investigation of the characteristics and development of Hebrew reflective literature. In succeeding years corresponding courses in the Psalm, Wisdom, and Legal literature of the Old Testament will be offered. *Professor* FOWLER.

Three hours. Through the year. Elective for Graduates and approved Undergraduates.

7. *Textual Criticism of the Old Testament*

The principles and method of textual criticism, in connection with the study of one of the shorter prophetical books. *Dr.* STERN.

Three hours. One semester. Offered if applied for by Graduates.

8. *Biblical Aramaic*

Grammar and reading of the Aramaic portions of the Old Testament. *Dr.* STERN.

Three hours. One semester. Offered if applied for by students who have credit for 1.

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‡ For conditions under which students may receive credit in the Newton Theological Institution for work done in this department, see the Catalogue, page 166.

9, 10. *Elementary Arabic*

Grammar; exercises in writing Arabic; translation of prose selections. *Professor* Fowler.

Two hours. Through the year. Elective for Seniors and Graduates.

11, 12. *Gospels and Epistles*

Characteristics of Hellenistic Greek; translation, and investigation of date, authorship, and thought. First semester, the Gospel and Epistles of John, the Gospel of Mark. Second semester, the Gospels of Matthew and Luke. *Professor* Fowler.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Either semester may be elected independently. *Wed., Fri., Sat., at 11.20.*

[13, 14. *Acts and Pauline Epistles*]

First semester, Acts and Thessalonians. Second semester, Galatians, Corinthians, and Romans.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Not offered in 1913–14.

LITERATURE AND HISTORY IN ENGLISH ‡

[15, 16. *Old Testament Literature and History*]

Includes nearly the entire Old Testament literature and history. In connection with course 17, 18, gives a comprehensive view of Biblical literature and history. The books are read in the best English translations. First semester, early Semitic history, Hebrew literature and history to the close of the United Kingdom. Second semester, Hebrew and Jewish literature and history from the division of the kingdom to the conquest of Alexander.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Not offered in 1913–14.

17, 18. *New Testament Literature and History*

Includes a large part of the Jewish writings from the conquest of Alexander to the destruction of Jerusalem, and the entire New Testament studied in its Jewish setting. Emphasis placed upon the connection between the literature and the history. In connection with course 15, 16, gives a comprehensive view of Biblical literature and history. The books are read in the best English translations. First semester, Jewish literature and history from the beginning of the Greek period to the destruction of Jerusalem, the Gospels and other sources for the life of Christ. Second semester, outline of the life of Christ, literature and history of the Apostolic age. *Professor* Fowler.

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‡ Course 19, 20 gives a rapid survey of the Bible as a part of the world's literature. It is designed especially for those who do not expect to pursue further courses in this department. Courses 15, 16 and 17, 18 are introductory to more detailed courses in the University or the Theological Seminary. They are also designed for those who, without intending to specialize in this field, desire a comprehensive view of the nature and results of the historical as well as the literary study of the Bible.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. *Mon., Wed., Th., at 10.20.*

19, 20. *The English Bible as Literature*

An outline of the literary history of the Old and New Testaments; the literary forms represented in the Bible; the place of the Bible in English literature. Emphasis placed upon the literature itself and its connection with the present. Lectures and assigned readings from the English Bible. First semester, Old Testament literature from the beginning to the close of the Babylonian exile. Second semester, the completion of the Old Testament, and the New Testament literature. *Professor* Fowler.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. *Mon., Tu., Th., at 11.20.*

21,* 22.* *Biblical Seminary*

Subject for 1913–14 to be announced later. *Professor* Fowler.

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors who have taken courses in Biblical Literature and History or in Social Science.

23. *Principles of Historical Criticism and Research*

The general principles of historical criticism and the literature of historical theory. *Professor* Fowler.

One hour. One semester. Elective for Graduates of one year's standing. Required of all candidates for the degree of Doctor of Philosophy in Biblical Literature and History.

IV. BIOLOGY

Albert Davis Mead, Ph.D., Sc.D., *Professor of Biology*
Frederic Poole Gorham, A.M., *Associate Professor of Biology*
Herbert Eugene Walter, Ph.D., *Assistant Professor of Biology*
Philip Henry Mitchell, Ph.D., *Assistant Professor of Physiology*
John Burnham Ferguson, A.B., M.D., *Demonstrator in Anatomy*

1, 2. *General Biology*

The structure of animals and plants; elementary vital phenomena; the functions of organs; the development of organisms; classification. An outline of the more important biological theories, such as evolution, natural selection, variation, mutation and heredity, and the principles upon which modern hygiene and sanitation are based. The course will introduce the student to the use of the microscope, laboratory technic, and to scientific methods of observation and experiment. *Professor* Gorham.

Three hours. Six hours of attendance. Through the year. Required in Freshman or Sophomore year of candidates for the degree of Bachelor of Philosophy. Elective for Undergraduates. Lectures, *Mon., Tu., Th., at 3.20.* Laboratory, *1st div., Mon., Tu., Th., at 2.20; 2d div., Tu., Th., Sat., at 12.20.*

3, 4. *Comparative Anatomy of Vertebrates*

Intended not only for the general student, but also for those who are particularly interested in zoölogy and for those who expect to study medicine. The structure and significance of the various organs of vertebrates with particular reference to man. Students are permitted to attend clinics and autopsies at the Rhode Island Hospital. Laboratory work and lectures. *Professor* Walter.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1, 2. *Mon., Wed., Fri., at 8.*

5, 6. *Anatomy of the Nervous System*

A study of the gross and microscopic anatomy of the brain, nerves, and sense organs in man and other vertebrates. Designed particularly for those intending to study medicine or psychology. *Professor* Mead.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2.

7, 8. *Embryology and Histology*

The origin and the development of the individual body; the elementary structure of the adult organs. Practice in micro-technic. Adapted to the requirements of general students and of those intending to study medicine. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2. *Tu., Th., Sat., at 8.*

9, 10. *Advanced Histology and Pathology*

Advanced work in micro-technic and in normal and pathological histology. Adapted to individual requirements. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 1, 2, and 7, 8.

11, 12. *General Physiology*

General vital processes in plants and animals; the more special phenomena in higher animals, with their application to human physiology. Designed not only as an introduction to further work, but also as a general view of physiology. Lectures and laboratory work. *Professor* MITCHELL.

Three hours. Six hours of attendance. Through the year. Must be preceded by 1, 2, and by Chemistry 1, 2. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon., Tu., Th., at 3.20.*

13, 14. *Chemical Physiology*

The chemistry of proteins, carbohydrates, and fats; the physiology of the digestive system, with the study of secretions and of artificial salivary, gastric, and pancreatic digestions; examination of blood, bile, and urine; the analysis of foods, with special reference to milk. Designed for those who are interested in physiology either from a medical or a general standpoint, and for those who are specializing in chemistry and desire a knowledge of vital chemical processes. *Professor* MITCHELL.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for or are taking Chemistry 7, 8. *Tu., Fri., Sat., at 10.20.*

15. *Invertebrate Zoölogy*

A study of the natural history of invertebrate animals, particularly marine forms, insects, and protozoa. Lectures with laboratory and field work. *Professor* Walter.

Three hours. Six hours of attendance. First semester. Elective for Undergraduates. *Tu., Th., Sat., at 8.*

16. *Bacteriology*

A general discussion of bacteria in all their relations, with special attention in the laboratory to the methods of studying bacteria, including the isolation, systematic study, and determination of unknown species. Lectures and laboratory work. *Professor* Gorham.

Three hours. Six hours of attendance. Second semester. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon., Wed., Th., at 10.20.*

17, 18. *Advanced Bacteriology*

Practical work in the preparation of culture media; methods of sterilization and disinfection; qualitative and quantitative biological examination of water, milk, air, soil, and sewage; study of certain pathogenic organisms, with the determination of their pathogenic properties, and the methods of bacteriological diagnosis of disease. Laboratory work and seminary. *Professor* Gorham.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 16.

20. *Ornithology*

A study of birds regarded as a group of living animals, in relation to their environment. Lectures and early morning field trips for the identification of wild birds during their spring migration. *Professor* Walter.

One hour. Two hours of attendance. Second semester. Elective for Undergraduates.

22. *Evolution*

The history of biology, principles of classification, geographical distribution, heredity, natural selection, variation, Mendelism, and the relationship of man to the lower animals. Designed particularly for those who have not studied biology. Lectures and assigned reading. *Professor* Mead.

Three hours. Second semester. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

[24. *Physiology*]

A general survey of the activities of living organisms with special reference to the human body, including some applications of modern physiology to healthful living. Lectures and assigned reading.

Three hours. Second semester. Elective for Juniors and Seniors. Not offered in 1913–14.

31, 32. *Human Anatomy*

A course in practical dissection. Students are permitted to attend clinics and autopsies at the Rhode Island Hospital. *Dr.* FERGUSON.

Three hours. Through the year. Elective for Graduates.

33, 34. *Biological Research*

Research work arranged to meet the requirements of individual students. *Professor* MEAD.

Three to twelve hours. Through the year. Elective for Graduates.

35, 36. *Advanced Physiology*

Laboratory work and seminary. *Professor* MITCHELL.

Three to twelve hours. Through the year. Elective for Graduates who have sufficient knowledge of chemistry and physiology.

37, 38. *Bacteriological Research*

Research work arranged to meet the requirements of individual students. *Professor* GORHAM.

Three to twelve hours. Through the year. Elective for Graduates who have credit for 16 and 17, 18.

39, 40. *Biological Theories and Problems*

Seminary course. *Professor* MEAD.

One to three hours. Through the year. Elective for Graduates.

41, 42. *Zoölogical Seminary*

Reading and discussion of German zoölogical literature selected with reference to the needs of individual students. *Professor* WALTER.

One to three hours. Through the year. Elective for Graduates.

V. BOTANY‡

Harlan Harvey York, Ph.D., *Assistant Professor of Botany*

1, 2. *General Course*

Designed not only as a general culture course, giving the student a definite conception of the vital importance of botany as related to modern life, but also as a preliminary training for those who contemplate further work in botany. The origin, development, structure, physiology, and classification of plants. A discussion of biological subjects of fundamental human interest, such as evolution, the origin of new species, and the general laws of inheritance in plants.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. Lectures, *Mon., Wed., at 8.* Laboratory, *Mon., Tu., 2.20 to 4.20.*

3, 4. *Physiological Anatomy*

Intended for students who are planning to study medicine, agriculture, forestry, or plant pathology, as well as for those who expect to teach or pursue further work in botany. The origin, minute structure, and physiological function of plant tissues; reproduction, cytology, methods in micro-technic. The biological purpose of this course is to help the student to understand how plants, by the differentiation of cells and their association into tissues adapted to perform different kinds of work, are able to meet the conditions of their environment.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2, or its equivalent.

5, 6. *Comparative Morphology and Phylogeny*

Designed not only for the general student, but for those who expect to teach, and for those who are particularly interested in botany. Methods in micro-technic. Intended to acquaint the student with a wider range of scientific methods in plant biology through a more comprehensive knowledge of plant forms and the more fundamental conclusions of morphology and phylogeny. Special emphasis will be placed upon the evolution, morphology, and classification of plants.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2, or its equivalent.

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‡ In courses dealing with diseases of trees the department will be assisted by James Franklin Collins, Ph.B., Forest Pathologist in charge of the Government Station at the University.

7, 8. *Special Course*

Special work on various phases of botany arranged to meet the requirements of individual students. May be taken in successive years. Students electing this course must plan it definitely, in consultation with the instructor, before June 1 of the preceding academic year.

One or more hours. Through the year. Either semester may be elected independently. Elective for Graduates, and for approved Juniors and Seniors.

9. *Diseases of Plants*

Designed to give the student a definite idea of one of the most fundamental relations of botany to the food supply of man, and to stimulate further inquiry into an inexhaustible field of science. An introduction to the nature, causes, and remedies of diseases of plants. Lectures and demonstrations.

One hour. Two hours of attendance. First semester. Elective for Undergraduates. Lectures, *Fri. at 8.*

10. *Trees*

Intended to familiarize the student with the common native and introduced trees of Rhode Island. Special attention will be given to their structure and economic value. Lectures and field work.

One hour. Two hours of attendance. Second semester. Elective for Undergraduates. Lectures, *Fri. at 8.*

[11, 12. *Physiology*]

Includes a study of imbibition, diffusion, osmosis, turgor, and the retention of bodily form; relation of soil and solutes to the plant; transpiration and exudation; movement of materials within the plant body; photosynthesis; respiration; growth and movement; reproduction and death.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2, and 3, 4, or 5, 6, and for Graduates. Not offered in 1913–14.

13, 14. *Plant Pathology*

General course, including the identification of bacteria and fungi which cause diseases in our more common cultivated and native plants and native and introduced trees; their manner of infection and effects on their hosts, methods of prevention and control, and methods of culture and inoculation which are employed in the laboratory in the study of diseases of plants.

Three hours. Six hours of attendance. Through the year. Must be preceded by 1, 2, and 3, 4, or 5, 6.

VI. CHEMISTRY

John Howard Appleton, A.M., Sc.D., *Newport-Rogers Professor of Chemistry*

John Emery Bucher, Ph.D., *Associate Professor of Organic Chemistry*

Norman Edward Holt, Sc.M., *Instructor in Chemistry*

Robert Gamble Caswell, Sc.M., *Instructor in Chemistry*

1, 2. *Descriptive Chemistry* ‡

Non-metals; metals, their metallurgy, compounds, and practical applications; theoretical chemistry. Lectures with experiments; written exercises; individual laboratory work. *Professor* Bucher *and Mr.* Holt.

Three hours. Through the year. Elective for Undergraduates. *1st div., Mon., Th., at 10.20; 2d div., Tu., Fri., at 10.20.* Laboratory hours to be arranged with the instructor.

3, 4. *Qualitative and Quantitative Analysis*

Properties of the metallic elements; their separation from certain of their compounds. The principal non-metals and the acids formed by them; methods of separation and recognition of acids and acid radicles. Quantitative precipitations and separations of the most important elements and compounds; the principles upon which quantitative apparatus is constructed. Laboratory work; recitations in qualitative analysis and in chemical philosophy; exercises in stoichiometry. *Professor* Appleton *and Mr.* Caswell.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2. *1st div., Fri. at 11.20; 2d div., Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

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‡ Credit for the entrance requirement in Chemistry admits only to 1, 2, which may be taken also without previous preparation. Students who wish to enter more advanced courses without taking 1, 2 must pass a special test at the time of the entrance examination in Chemistry. This test will cover the following topics: 1. All of the non-metals with their principal compounds and the processes of manufacture of the chief commercial products from non-metals. 2. About thirty important metals, their occurrence, preparation from the ore, the preparation and uses of their chief compounds. 3. The general principles of chemical action which depend upon physical laws. 4. Methods of making chemical computations of moderate difficulty. Preparation for this test may require the equivalent of six hours a week for one school year.

5, 6. *Quantitative Analysis, Advanced Course*

Assaying of metallic ores; analysis of agricultural materials; testing of chemicals used in textile establishments, etc. *Professor* Appleton *and Mr.* Caswell.

Six hours. Twelve hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3, 4. Laboratory hours to be arranged with the instructor.

7, 8. *Organic Chemistry*

Preparation and analysis of representative organic compounds. Lectures, recitations, and laboratory work. *Professor* Bucher *and Mr.* Holt.

Six hours. Through the year. Elective for approved Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

10. *Assaying*

Professor Appleton *and Mr.* Caswell.

Six hours. Twelve hours of attendance. Second semester. Elective for Seniors and Graduates who have credit for 1-4.

12. *Organic Dyes*

The chemistry and use of mordants, dyes, etc. *Professor* Appleton *and Mr.* Caswell.

Six hours. Twelve hours of attendance. Second semester. Elective for approved Seniors and Graduates.

[13, 14. *Industrial Chemistry*]

Lectures and laboratory work.

Three to six hours. Six to twelve hours of attendance. Through the year. Elective for approved Graduates. Either semester may be elected independently. Not offered in 1913–14.

15, 16. *Physical Chemistry*

Lectures and laboratory work.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

17, 18. *Physical Chemistry, Advanced Course*
Lectures and laboratory work. *Professor* Bucher.

Three hours. Through the year. Elective for approved Graduates who have credit for Physics 1-4, and have credit for or are taking Mathematics 7, 8.

[19. *Organic Chemistry, Advanced Course*]

Three hours. First semester. Elective for approved Graduates. Not offered in 1913–14.

20. *Inorganic Chemistry, Advanced Course*
Professor Bucher.

Three hours. Second semester. Elective for approved Juniors, Seniors, and Graduates.

21, 22. *Organic Preparations, Advanced Course*
Professor Bucher.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

23, 24. *Inorganic Preparations, Advanced Course*
Professor Bucher.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 7, 8.

25, 26. *Research Work in Chemistry*
Professor Bucher.

Three or more hours. Through the year. Elective for Graduates.

27, 28. *Conference on Special Topics in Chemistry*
Professor Bucher.

One hour. Through the year. Elective for approved students.

29, 30. *Conference on Special Topics in Chemistry*
Professor Appleton.

One hour. Through the year. Elective for approved students.

31, 32. *Industrial Chemistry and Research*
Professor Appleton.

Three or more hours. Through the year. Elective for approved Graduates.

VII. CIVIL ENGINEERING‡

John Edward Hill, C.E.M., Sc.D., *Professor of Civil Engineering*
Hardy Cross, Sc.B., C.E.M., *Assistant Professor of Civil Engineering*
Roland Ellis Hutchins, Sc.B., *Instructor in Civil Engineering*

1 a, 1 b; 2 a, 2 b. *Surveying*

Theory and practice of plane surveying; use of tape, compass, level, and transit; adjustment of instruments; pen topography; contour drawing; conventional signs; plotting. *Professor* Hill *and Mr.* Hutchins.

Three hours and two hours, and one hour and two hours. Through the year. Elective for students who have credit for Mathematics 17 and 18 and Mechanical Drawing 2. Parts a and b may not be elected separately. First semester, *Mon., Tu., Th., at 11.20; Mon., Th., 2 to 5.* Second semester, *Mon. at 11.20; Mon., Th., 2 to 5.*

4. *Surveying, Advanced Field Work*

Use of stadia, plane table, and barometer; precise base-line measurement with steel tape; triangulation; topography. *Professors* Hill *and* Cross, *Mr.* Hutchins.

One hour. Spring recess. Elective for students who have credit for 1 and are taking 2.

6, 7, 8, 9. *Railroad Engineering*

Theory, location, construction, and economics of railroad engineering. Lectures, recitations, field work, and drafting. Second semester, railroad curves and practical problems. First semester, actual location of a line about two miles long, map, and estimate of cost. Second semester, railroad track and track work; maintenance of way department; economics of location. First semester, earthwork and its cost; rock excavation; tunneling. *Professor* Hill *and Mr.* Hutchins.

Two, three (six hours of field work), two, and two hours. Second, first, second, and first semesters. Courses 6 and 7 are elective for students who have credit for 2. Courses 8 and 9 are elective for Juniors and Seniors. Second semester, *Tu., Th., at 11.20.* First semester, *Wed., 9.20 to 5.* Second semester, *Tu., Th., at 9.20.* First semester, *Fri. at 9.20; Mon., 2.20 to 5.20.*

10. *Geodesy*

Problems in geodetic surveying, with sufficient theory for a proper

understanding of the formulas used. Lectures, recitations, and computations. *Professor* HILL.

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‡ All courses in this department are required for the degree of Bachelor of Science in Civil Engineering.

Two hours. One hour of recitation and two hours of computations. Second semester. Elective for students who have credit for 4, and Astronomy 5. *Wed. at 11.20; Tu., 2.20 to 4.20.*

12. *Highway Engineering*

Economics and location of country roads; surveys, grades, drainage, and foundations; construction and maintenance; economics and design of pavements; dust prevention and preservation of macadam roads; use of bituminous materials in the construction and maintenance of roads; methods of testing road materials; roads and pavements in foreign countries; systems of administration and maintenance; highway laws. Lectures, recitations, inspection trips, and seminary work. *Mr.* HUTCHINS.

Three hours. Second semester. Elective for Sophomores, Juniors, and Seniors. *Mon., Tu., Th., at 8.*

13. *Hydraulic Engineering* ‡

Consideration of water supply mainly from a sanitary standpoint. A general course designed to give the chemical and biological aspects of water supply without laboratory work. Lectures, recitations, and seminary work. *Professor* HILL.

Two hours. First semester. Elective for Juniors and Seniors. *Mon., Th., at 10.20.*

15. *Theory of Structures*

Theory of statically determinate structures, as illustrated by the plate girder and bridge and roof trusses. Assumptions necessary in the more common cases of statical indetermination. Elements of the elastic theory of structures and applications. Analytical and graphical methods. The object is to develop accuracy in the application of the principles of mechanics to the practical problems of structural design and to establish a correct idea of the interrelation of theoretical investigations and practical details. Lectures, recitations, computations. *Professor* CROSS *and Mr.* HUTCHINS.

Five hours. First semester. Elective for students who have credit for Mechanics 2. *Tu., Wed., Th., at 8; Tu., Wed., at 9.20.*

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‡ Courses 13, 30, and 32 cover the general subject of sanitation.

19. *Bridge Design*

Complete design and shop details of a through plate girder railway bridge or similar structure, accompanied by lectures and discussions. Individual data are given, business-like methods are required, and a practical attitude towards the work is encouraged. Lectures, computations, drafting. *Professor* CROSS *and Mr.* HUTCHINS.

Three hours. One hour of recitation and four hours of drafting, or six hours of drafting. First semester. Elective for students who have credit for Mechanical Drawing 4, and have credit for or are taking 15. *Tu., 11.20 to 1.20; 2.20 to 6.20.*

20. *Bridge Design*

Theory and practice of truss detailing. General and working drawings are prepared for a pin or riveted truss bridge for highway or railway traffic and for a timber or steel roof truss, the work being adapted to the needs of the class. Erection, shop practice, specifications, and other points not covered in 15 are discussed. Lectures, computations, drafting. *Professor* CROSS *and Mr.* HUTCHINS.

Three hours. One hour of recitation and four hours of drafting, or six hours of drafting. Second semester. Elective for students who have credit for 15 and 19. *Tu., 11.20 to 1.20; 2.20 to 6.20.*

22. *Masonry Design*

Theory of dams, arches, retaining walls, and similar structures. Special attention given to the theory of reinforced concrete. Properties of concrete. Design of a dam, an arch, and of several reinforced concrete structures. Lectures, recitations, computations, drafting. *Professor* CROSS *and Mr.* HUTCHINS.

Five hours. Two hours of recitation and six hours of drafting. Second semester. Elective for students who have credit for 15, and Mechanical Drawing 4. *Mon. at 10.20; Th., 10.20 to 1.20; 2.20 to 6.20.*

24. *Foundations*

Methods employed and results to be expected in foundation work. Special attention given to the more common cases. Lectures and recitations. *Professor* CROSS.

One hour. Second semester. Elective for students who have credit for Mechanics 2. *Mon. at 9.20.*

26. *Contracts and Specifications*

Law of contracts. Practical considerations in contracting. Preparation of specifications. Interpretation of contracts. Lectures and recitations. *Professor* Cross.

One hour. Second semester. Required of all candidates for the degree of Bachelor of Science. *Th. at 9.20.*

28. *Engineering Jurisprudence*

The legal and some of the economic problems involved in engineering work. The object is to emphasize the importance of these considerations in the solution of technical problems and to interest the student in further investigation. Lectures and recitations. *Professor* Cross.

One hour. Second semester. Elective for Juniors and Seniors. *Tu. at 9.20.*

30. *Hydraulic Engineering* ‡

Consideration of water supply mainly from an engineering standpoint. Irrigation, pumps and pumping machinery; construction of dams and reservoirs. Lectures, recitations, and seminary work. Supplements Mechanics 3, which gives the theoretical treatment of the subject. *Professor* Hill.

Two hours. Second semester. Elective for students who have credit for Mechanics 3. *Tu., Fri., at 10.20.*

32. *Sanitary Engineering* ‡

Theory of sewerage, treatment and disposal of sewage; stream pollution; house drainage and its appliances; garbage collection and disposal; design of sanitary works. Lectures, recitations, drafting, and seminary work. *Professor* Hill.

Three hours. Second semester. Elective for students who have credit for Mechanics 3. *Wed., Fri., at 9.20; Mon., 2.20 to 5.20.*

34. *Hydraulic Surveying* (*applied Hydraulics*)

Methods of surveying applicable to river and harbor work. Methods of measuring and rating the flow of streams. Actual measurement of the discharge of a stream by means of the current meter, weir, and floats. Recitations and field work. *Mr.* Hutchins.

One hour. Three hours of recitation or eight hours of field work last third of second semester. Elective for students who have credit for 2 and Mechanics 3. *Mon., Wed., Fri., at 11.20; or Tu., 9.20 to 5.20.*

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‡ Courses 13, 30, and 32 cover the general subject of sanitation.

35, 36. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Civil Engineering. The thesis must embody either a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

VIII. ECONOMICS ‡

HENRY BRAYTON GARDNER, PH.D., *Professor of Economics*
JAMES MARVIN MOTLEY, PH.D., *Associate Professor of Economics*

1. *Elementary Economics*

Affords an outline and discussion of the fundamental principles of the subject. *Professors* GARDNER *and* MOTLEY.

Three hours. In connection with Social and Political Science 1 constitutes a year course required in Sophomore, Junior, or Senior year of candidates for the degree of Bachelor of Arts, and in Sophomore year of candidates for the degree of Bachelor of Science. Elective for others. Beginning with the class entering in 1911, required in Sophomore, Junior, or Senior year, of candidates for the degree of Bachelor of Philosophy. The combined courses will be given in two sections. For the first section Economics will be given in the first semester and Social and Political Science in the second semester. *Tu., Fri., Sat., at 10.20.* For the second section Social and Political Science will be given in the first semester and Economics in the second semester. *Mon., Wed., Fri., at 12.20.* Students must indicate their choice of section on the registration card.

5, 6. *Money and Banking*

Principles of money; recent monetary history, particularly of the United States; systems of the leading industrial nations; present problems. Principles of banking; recent banking history, particularly of the United States; systems of the leading industrial nations; present problems, with special reference to the problem of the reform of the banking system in the United States. *Professor* GARDNER.

Three hours. Two hours of attendance. Through the year. *Wed., Fri., Sat., at 11.20.*

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‡ The courses in this department other than 1 are open only to students who have credit for Economics 1, and Social and Political Science 1.

7. *Socialism and Labor Problems*

A brief review of the historically important socialistic schemes; an analysis and criticism of the leading socialistic theories, with special emphasis upon present day proposals; the rise of the trade union and the influence of collective bargaining; labor problems in the United States. *Professor* MOTLEY.

Three hours. First semester. *Mon., Tu., Th., at 11.20.*

10. *Tariff, Reciprocity, and Shipping Subsidies*

The development of the American system of protection and its effect upon domestic industry and international commerce; an analysis and criticism of arguments for protective tariff and for free trade; reciprocity agreements; policies of leading nations with regard to state aid to shipping. *Professor* MOTLEY.

Three hours. Second semester. *Mon., Tu., Th., at 11.20.*

11, 12. *Public Finance and Financial History*

General principles of public finance; revenues and expenditures of leading industrial nations; public enterprises in their financial aspects; principal forms of taxation and their effects; public debts. Special attention will be given to the financial history of the United States from the adoption of the Constitution to the present day. *Professor* GARDNER.

Three hours. Through the year. *Tu., Th., Sat., at 12.20.*

[13. *Statistics*]

The principles of statistics as a method of recording and presenting social and economic facts; the possibilities and limitations of the statistical method; the interpretation of statistics; some of the important results of statistical investigation.

Three hours. First semester. Not offered in 1913–14.

[14. *Accounting*]

The importance of accounting in economic life and the principles which underlie it; the accounting systems of public bodies and quasi-public corporations; the interpretation of financial statements.

Three hours. Second semester. Not offered in 1913–14.

15. *Trade and Transportation*

The organization of international trade and the place of the United States in the commerce of the world; a description of the existing trade relations of the United States, of the conditions which control them, and the probable lines of their development, the organization and development of the internal trade of the United States with special reference to railway transportation and the problems to which it has given rise. *Professor* MOTLEY.

Three hours. First semester. *Mon., Wed., Th., at 10.20.*

16. *Corporations and Corporation Finance*

The corporation as a form of business organization; its formation and promotion; capitalization; forms of securities; the stock market; state and federal control and similar topics. *Professor* MOTLEY.

Three hours. Second semester. *Mon., Wed., Th., at 10.20.*

21, 22. *Investigation of Special Topics*

Intended to afford a training in methods of gathering, handling, and presenting data in the study of economic life and problems. Each student is assigned a separate topic. *Professor* GARDNER.

Three hours. Six hours of attendance. Through the year. Either semester may be elected independently. Students intending to take either of these courses must secure the permission of the head of the department not later than December 1 or June 1 in the semester preceding that in which they desire to take the course. It is expected that as a rule these courses will be taken in connection with lecture courses. Hours to be arranged with the instructor.

23, 24. *Economic Seminary*

Study of important aspects of economic theory, history, and current problems of economic life. *Professors* GARDNER *and* MOTLEY.

Three hours. Two hours of attendance. Through the year. Elective for Seniors and Graduates who have taken advanced work in Economics. Hours to be arranged with the instructor.

IX. EDUCATION ‡

Walter Ballou Jacobs, A.M., *Professor of Education*
Stephen Sheldon Colvin, Ph.D., *Professor of Educational Psychology*

1. *History of Education*

Education among the early culture peoples; development of education in Greece and Rome; early Christian education; the Renaissance and humanism; the beginnings of modern education; the naturalistic movement, Rousseau; the psychological movement, Pestalozzi, Froebel, Herbart; the scientific movement, Spencer and Huxley; education in the United States; recent sociological tendencies; the movement for industrial education. *Professor* Jacobs.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates, and by permission. *Mon., Wed., Fri., at 12.20.*

2. *Principles of Education*

The meaning and aim of education; its function as a social institution; physical education—heredity, growth, and development; intellectual education—its aim, the choice of studies, their organization into a consistent whole; the principles of method in teaching; moral education. Education as limited by environment and as gaining the mastery over environment. *Professor* Jacobs.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates, and by permission. *Mon., Wed., Fri., at 12.20.*

3. *Psychology of Education*

A study of the general principles of learning and a discussion of habit formation, and of the various activities of mind involved in the process of education,—sensation and perception, imagination, association and memory, attention and interest, the higher mental processes.

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‡ Courses 1 and 2 treat education in its relation to the individual and to the social and political whole; interest in them is therefore not limited to those who intend to teach. At the same time they form an introduction to the more advanced courses in Education. Those who intend to teach are advised to elect these courses during the Junior year.

Courses 1-4 cover the usual requirements for certificates of the First Grade except where practice teaching or experience is demanded. In Rhode Island a certificate is required of all teachers in schools supported in whole or in part by public money. Certificates of the First Grade are granted without examination to those who have completed courses 1-4 and hold a college degree. Due credit is also given for separate courses.

Certificates, authorizing the holders to teach in the evening schools of the state, are issued without examination to students who have completed three years of regular work, including Education 1, 2.

For further explanation of the work of this department, see the Catalogue, page 167.

The course also discusses the problem of transfer in training; work and play; fatigue; economical methods of learning; tests of mental capabilities. *Professor* Colvin.

Three hours. First semester. Elective for students who have credit for 1 or 2, or who are taking 1, and for Graduates. *Mon., Tu., Th., at 11.20.*

4. *Practical Introduction to Teaching*

The elements of method and their application in practice teaching; observation of good teaching; management and discipline of classes; administration of education; school buildings, their proper construction, maintenance, and equipment; medical inspection; school law. *Professor* Colvin.

Three hours. Second semester. Elective for students who have credit for or are taking other courses in Education, and for Graduates. *Mon., Tu., Th., at 11.20.*

5. *Secondary Education;*‡ *Organization and Function*

The place of the high school and academy in the American system of education; comparison with secondary schools in Germany, France, and England; the administration of secondary education; its relation to the colleges and universities; meaning and value of the various secondary school studies, and their organization into a curriculum; high schools; the social life of the high school and academy; high school extension. *Professor* Jacobs.

Three hours. Two hours of attendance. First semester. Elective for Graduates and experienced teachers, and for approved Seniors. *Wed., 3.20 to 5.20.*

6. *Secondary Education;*‡ *Methods and Processes*

The principles of method as applied to teaching in secondary schools; the resources at the command of the teacher; the preparation of teachers. The following will receive special attention as typical secondary school studies: English, Modern Languages, and Latin; History, Science, and Mathematics; the Manual Arts. *Professor* Jacobs.

Three hours. Two hours of attendance. Second semester. Elective for Graduates and experienced teachers, and for approved Seniors. *Wed., 3.20 to 5.20.*

7, 8. *Problems in Practical Teaching; Secondary Schools*

Practice teaching in the Providence High Schools. Observation, reports, and conferences. Designed for those who wish to become instructors in colleges, teachers or principals in secondary schools, or superintendents of schools. *Professor* Colvin, *assisted by the* Supervising Teachers.

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‡ In the courses in Secondary Education, Professor Jacobs will be assisted by the following Lecturers on Method:

Charles Edward Dennis, Ph.D., *Latin.*
Jesse Madison Gathany, A.M., *History.*
Harold Charles Newton, A.M., *English.*
Richard Owen Dummer, A.M., *Physics and Chemistry.*

Three hours. Through the year. Elective for Graduates who have credit for elementary courses in Education and are taking 5 and 6, and for approved Seniors. *Fri. at 3.20*, and at other hours to be arranged.

9, 10. *Problems in Practical Teaching; Grammar Grades*

Practice teaching in the Providence Grammar Schools. Observation, reports, and conferences. Designed especially for those who wish to become grade teachers, principals of grammar schools, or superintendents of schools, but also for those who wish to teach in secondary schools. The following studies receive special attention: Arithmetic, Language, History, and Geography. *Professor* Colvin, *assisted by the* Supervising Teachers.

Three hours. Through the year. Elective for Graduates who have credit for elementary courses in Education and are taking 11, 12, and for approved Seniors. *Mon. at 3.20*, and at other hours to be arranged.

11, 12. *Experimental Education*

A laboratory course in educational psychology. The principal methods which have been used in measuring mental and physical capabilities will be reviewed and discussed. Under guidance the student will work through a number of the most important of these methods in the laboratory. He will also conduct a specific experiment in some phase of experimental education, report on his results from time to time, and finally set these forth in the form of a thesis. *Professor* Colvin.

Three hours. Through the year. Elective for Graduates and experienced teachers.

13, 14. *Educational Administration*

Problems of educational administration in the State of Rhode Island and in the cities and towns of the state. In the study of these problems the varied experiences and experiments of other states and of European countries will be considered. Out of this study will be developed the principles underlying national and municipal administration of education. *Professor* Jacobs.

Three hours. Through the year. Two hours of attendance. Elective for Graduates, experienced teachers, principals, and superintendents, and for approved Seniors. *Th., 4 to 6.*

15, 16. *Seminary in Education*

Studies in current educational problems. The seminary will be conducted in two parts in successive hours. *Part A.* Reviews of the latest books upon education and related subjects, and studies of special problems assigned to individual students for investigation and experiment. *Part B.* A more intensive study of certain problems of current interest. For 1913–14 the subjects will be: First semester, Means of Measuring Educational Products. Second semester, Sociological Phases of Education. As subjects are not repeated, the course may be elected for successive years. *Professor* JACOBS.

Three hours. Through the year. Two hours of attendance. Required of student-teachers. Elective for Graduates and experienced teachers, and for approved Seniors. A or B may be elected independently as a one-hour course. *Sat., 10.20 to 12.20.*

X. ENGLISH ‡

WALTER COCHRANE BRONSON, A.M., LITT.D., *Professor of English Literature*

LINDSAY TODD DAMON, A.B., *Professor of English Literature and Rhetoric*

ALBERT KNIGHT POTTER, A.M., *Associate Professor of the English Language*

GEORGE WYLLYS BENEDICT, PH.D., *Associate Professor of English*

THOMAS CROSBY, A.M., *Associate Professor of English and Public Speaking*

HENRY BARRETT HUNTINGTON, A.B., *Associate Professor of English*

WILLIAM THOMSON HASTINGS, A.M., *Assistant Professor of English*

WALTER CLARKE PHILLIPS, A.M., *Instructor in English*

JOHN HENRY WILLIAMS, A.B., *Instructor in English*

————————————, *Assistant in English*

————————————, *Assistant in English*

————————————, *Assistant in English*

1. *Rhetoric and Composition*

Designed primarily to teach clear and correct expression. Training in the fundamentals of prose composition. Lectures, recitations, and themes. *Professors* Damon, Benedict, *and* Hastings, *Messrs.* Phillips, Williams, ——, ——, *and* ——.

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‡ Credit for English 1 or 2 is a prerequisite for admission to all other courses in the department except 48.

Courses 1-16 may not be counted in fulfilment of the requirement of a year in English Literature.

Three hours. First semester. Required of all Freshmen. *1st, 2d, and 3d div., Mon., Tu., Th., at 11.20; 4th, 5th, and 6th div., Mon., Wed., Fri., at 12.20; 7th div., Wed., Fri., Sat., at 11.20; 8th div., Mon., Tu., Th., at 3.20.* Candidates for the degree of Bachelor of Science will register in divisions 4 and 5.

2. *Rhetoric and Composition*

A continuation of 1. Designed primarily to give training in the method, structure, and style of the chief forms of prose composition. Lectures, recitations, and themes. *Professors* Benedict *and* Hastings, *Messrs.* Phillips, Williams, ——, ——, *and* ——.

Three hours. Second semester. Required in the Freshman year of all candidates for the degree of Bachelor of Science, and in the Sophomore year of all candidates for the degree of Bachelor of Arts or Bachelor of Philosophy. Students electing 3, 4 may substitute 3 for 2. Students taking 7, 8 instead of Freshman mathematics may omit 2 in their Sophomore year and take 3 in their Junior year, if they obtained at least the grade of C in 1. *1st and 2d div., Mon., Tu., Th., at 11.20; 3d, 4th, and 5th div., Mon., Wed., Fri., at 12.20; 6th div., Wed., Fri., Sat., at 11.20; 7th div., Mon., Tu., Th., at 3.20.* Freshman candidates for the degree of Bachelor of Science will register in sections 3 and 4. Students repeating 1 or 2 will register in sections 5 and 6.

48. *English Literature from the Beginning to 1798*

An outline course in the history of English literature to the end of the eighteenth century, with reading and study of the greater writers. *Professors* Bronson *and* Damon.

Three hours. Second semester. Required in the Freshman year of all candidates for the degree of Bachelor of Arts or Bachelor of Philosophy. *1st and 2d div., Mon., Tu., Th., at 11.20; 3d div., Mon., Wed., Fri., at 12.20.*

3, 4. *English Composition, Second Course*

Intended to supplement the training given in 1, 2, and to develop further the power of exact and lucid statement. Lectures, recitations, and prescribed reading; weekly themes and other written exercises involving a variety of specific tasks such as abstracts, reports, scientific, technical, and historical papers, criticisms, stories, personal essays, etc. *Professor* Hastings.

Three hours. Through the year. Elective for Sophomores and Juniors. Students electing 3, 4 may substitute 3 for 2. *Mon., Wed., Th., at 10.20.*

5, 6. *English Composition, Advanced Course*

Intended to develop ease of style and clarity and vigor of thought. Frequent practice in composition and criticism. *Professor* Damon.

Three hours. Through the year. Elective for Juniors and Seniors. With the consent of the instructor the course may be repeated. *Tu., Fri., Sat., at 10.20.*

7, 8. *Argumentative Composition*

Intended to develop the power of handling argumentative topics cogently and persuasively. Lectures on the principles and forms of argumentative composition; frequent practice in brief-drawing and the writing of forensics and less formal arguments. *Professor* Huntington.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors; required in the Sophomore year of candidates for the degree of Bachelor of Philosophy who did not elect to take mathematics in their Freshman year. *Tu., Fri., Sat., at 10.20.*

10. *Debate*

Intended to train students in correct and vigorous oral presentation of ideas. *Professor* Huntington, *with the coöperation of the Professors of Economics, Social and Political Science, History, and Public Speaking.*

Three hours. Second semester. Elective for a limited number of Juniors and Seniors who have credit for 7. With the consent of the instructor the course may be repeated. *Mon., 3.20 to 5.20; Fri., 2.20 to 4.20.*

11, 12. *Public Speaking*

Principles of voice culture; vocal interpretation of literature; extempore speaking. *Professor* Crosby.

Three hours. Through the year. Elective for Sophomores and Juniors. *Mon., Tu., Th., at 11.20.*

[13, 14. *Public Speaking, Advanced Course*]

Practice in reading lyric, narrative, and dramatic literature, in extempore speaking, and in the composition and delivery of the common forms of the occasional address. Special attention to securing right tone-production and to improvement in speech.

Three hours. Through the year. Elective for students who have attained at least the grade of C in 11, 12. Not offered in 1913–14.

15, 16. *Old English*

Essentials of Anglo-Saxon grammar; prose selections; Beowulf. *Professor* Benedict.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 4.20.*

17, 18. *Chaucer*

A study of the poems as literature, with sufficient attention to Middle English grammar to enable the student to read intelligently. Selections from Langland and Gower. *Professor* Potter.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 3.20.*

21, 22. *The Drama in England to 1642*

The drama as a literary type and its history in England to the closing of the theatres. *Professor* Potter.

Three hours. Two hours of attendance. Through the year. Elective for students who have credit for a year's work in English Literature. In 1913–14 conducted as the Seminary in English Literature.

23, 24. *The Modern English Drama*

The history of the English drama from 1660 to the present time. Reading and discussion of the work of the chief playwrights from Wycherley and Congreve to Jones, Pinero, and Shaw. *Professor* Crosby.

Three hours. Through the year. Elective for students who have credit for a year's work in English Literature. *Tu., Th., Sat., at 12.20.* Not to be offered in 1914–15.

25, 26. *Shakspere*

Careful study of a few plays with special attention to exact interpretation. In 1913–14 the plays read will be *Macbeth, The Winter's Tale, King Lear, Richard II, Antony and Cleopatra, Twelfth Night. Professor* Hastings.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Wed., Fri., Sat., at 11.20.* Not to be offered in 1914–15.

27, 28. *Shakspere*

A brief survey of the drama before Shakspere. Shakspere as playwright and poet. Reading of all the plays; careful study of the great tragedies. Lectures, discussions, and reports on assigned topics. *Professor* POTTER.

Three hours. Through the year. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.20.*

31, 32. *English Literature from 1660 to 1798*

The Restoration drama; the classical school; development of the essay and the novel; the beginnings of romanticism. Dryden, Wycherley, Congreve, Addison, Swift, Defoe, Richardson, Fielding, Pope, Gray, Collins, Smollett, Sterne, Johnson, Goldsmith, Burke, Burns. First semester, *Professor* HUNTINGTON. Second semester, *Professor* BRONSON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for a year's work in English Literature. Not to be offered in 1914–15.

[33, 34. *The English Novel*]

The history of the English novel from 1700 to 1900; reading and discussion of the greater English novelists, including Defoe, Richardson, Fielding, and Smollett in the eighteenth century, and Scott, Jane Austen, Dickens, Thackeray, Charlotte Brontë, George Eliot, Meredith, Hardy, and Stevenson in the nineteenth century.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for a year's work in English Literature. Not offered in 1913–14.

35. *English Literature from 1798 to 1832, Poetry*

The reaction from classicism; the influence of the French Revolution; liberalism and individualism in English poetry; contemporary criticism. Wordsworth, Coleridge, Southey, Scott, Byron, Shelley, Keats, Landor. *Professor* BENEDICT.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. First semester. Elective for Sophomores, Juniors, and Seniors. *Mon., Tu., Th., at 11.20.*

36. *English Literature from 1798 to 1832, Prose*

The development of the romantic novel; the rise of the reviews and quarterlies; essays and miscellaneous prose. Scott, Jane Austen, Coleridge, Jeffrey, De Quincey, Lamb, Hazlitt. *Professor* BENEDICT.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Second semester. Elective for Sophomores, Juniors, and Seniors. *Mon., Tu., Th., at 11.20.*

37. *English Literature from 1832 to 1892, Prose*

Modifications of romanticism; realism; the influence of science and democracy; tendencies at the end of the century. Essays, history, miscellaneous prose, the novel. Macaulay, Carlyle, Arnold, Ruskin, Pater, Newman, Huxley, Dickens, Thackeray, the Brontës, George Eliot. *Professors* BRONSON *and* DAMON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. First semester. Elective for Sophomores, Juniors, and Seniors. *1st div., Mon., Wed., Fri., at 12.20; 2d div., Wed., Fri., Sat., at 11.20.*

38. *English Literature from 1832 to 1892, Poetry*

Modifications of romanticism; Pre-Raphaelitism; the influence of science and democracy; tendencies at the end of the century. Tennyson, Browning, Arnold, Clough, Rossetti, Morris, Swinburne. *Professor* DAMON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Second semester. Elective for Sophomores, Juniors, and Seniors. *Wed., Fri., Sat., at 11.20.*

39, 40. *American Literature*

American literature from the beginning to 1900, in its relation to American life and to English literature. A rapid survey of the literature of the seventeenth and eighteenth centuries; reading and study of the writers of the nineteenth century, with special attention to Irving, Cooper, Bryant, Poe, Longfellow, Emerson, Hawthorne, Whittier, Lowell, Holmes, and Whitman. *Professor* BRONSON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for a year's work in English Literature. *Tu., Wed., Sat., at 9.20.* Not to be offered in 1914–15.

[42. *Contemporary English and American Literature*]

A study of the tendencies of modern thought through the literature that reflects it. Reading and discussion of contemporary poets, novelists, and essayists.

Three hours. Second semester. Elective for Juniors and Seniors. Not offered in 1913–14.

[43, 44. *Seminary in English Literature*][‡]

Three hours. Two hours of attendance. Through the year. Elective for Graduates, and for a limited number of Seniors who have attained at least the grade of C in two years' work in English Literature. Not offered in 1913–14.

XI. GEOLOGY

Charles Wilson Brown, A.M., *Assistant Professor of Geology*
Albert Cary Hawkins, A.M., *Instructor in Geology*

1, 2. *General Geology*

A study of the development of the earth, with special reference to the North American Continent, including a discussion of earth origin, of the work of surface and interior agencies in the production of various topographic forms, rock types and their changes, crustal deformation and continent making, together with a survey of ancient life types and the principles of organic evolution they illustrate. First semester, physiographic and dynamic geology. Second semester, stratigraphy and paleontology.

Three hours. Through the year. Elective for Undergraduates. *Mon., Wed., Th., at 10.20.*

3, 4. *General Geology*

A shorter course than 1, 2, with emphasis upon the discussion of problems that may arise in engineering work. Special attention in map and field study to topographic features resulting from the various geologic agencies, and to the study of hand specimens of ores, minerals, and rock types and their uses. May be continued in 8.

Two hours. Four hours of attendance. Through the year. Required in the Junior year of candidates for the degree of Bachelor of Science in Civil Engineering. Not elective. First semester, *Mon. at 10.20; Fri. at 9.20.* Second semester, *Mon., Wed., at 10.20.*

6. *Economic Geography and Conservation*

A discussion of the laws of meteorology, and the relation of climate to soil products and to man and his development; the physiographic controls that influence the development of transportation and commerce; agriculture, forests, water power, and water supply; the location and proper development of cities; and the geographic distribution of ore deposits and other natural resources and their conservation. May be continued in 8, or 11, 12.

[‡] See Course 21, 22.

Three hours. Second semester. Elective for Undergraduates who have credit for 1 or 5, or who presented Physiography for admission, except Freshmen and Sophomores who are taking another course in the department. *Tu., Wed., Sat., at 9.20.*

7. *Economic Geology*

A discussion of the theories concerning the origin of ore deposits; the geologic relations, and the location, distribution, and production of ores.

Three hours. First semester. Elective for Undergraduates who have credit for 1, 3, or 9, 10.

8. *Stratigraphy and Structural Geology*

An introductory course in field geology. Study of areal and structural geology in igneous and sedimentary areas from geologic reports. Practice in the construction of geologic maps and work in the field areas.

Three hours. Second semester. One conference hour to be arranged, and five hours' work in the laboratory or field. Elective for Undergraduates who have credit for 1, 3, or 5.

9, 10. *Mineralogy and Petrography*

An introductory course in the macroscopic and microscopic study of minerals, ores, and rocks. First semester, discussion of crystal forms and the laws of crystallography, determination by physical properties and blow-pipe analysis of the more common minerals and ores. Second semester, study of the optical properties of the rock-forming minerals, rocks, and ores, under the polarizing microscope; determination of rock types; discussion of the fundamental principles of the origin and classification of rocks and ores.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Th., at 11.20.*

11, 12. *Research in Geology and Geography*

Advanced work in the library, laboratory, or field, in the various phases of geology or geography as outlined in the preceding elementary courses. The region in which the University is situated offers in a small compass both simple and complex problems in field research in structural, petrographic, mineralogic, paleontologic, and stratigraphic geology. Arranged to meet the requirements of individual students.

One to six hours. Through the year. Elective for Graduates and approved Undergraduates. Either semester may be elected independently.

[13. *The Stratigraphy and Paleontology of the Narragansett Basin*]

Designed to give, by study in the library and field, a detailed knowledge of the conditions of origin, relationships, structure, and fossil content, of the different groups of the carboniferous system represented in the Narragansett Bay region.

Three hours. One hour of attendance. First semester. Elective for Juniors, Seniors, and Graduates who have credit for Geology 1, 2, and 8, or their equivalents. Alternates with 7. Not offered in 1913–14.

XII. GERMANIC LANGUAGES AND LITERATURES‡

CAMILLO VON KLENZE, PH.D., *Professor of the Germanic Languages and Literatures*

ASA CLINTON CROWELL, PH.D., *Associate Professor of the Germanic Languages and Literatures*

ROBERT MCBURNEY MITCHELL, A.B., *Instructor in German*

JOHN HERBERT BACHMANN, A.M., *Instructor in German*

BERNARD KEENAN, A.M., *Instructor in German*

1, 2. *Elementary Course, First Year*

Reading, grammar, composition, conversation, dictation, sight reading. *Professor* CROWELL, *Messrs.* MITCHELL *and* BACHMANN.

Three hours. Through the year. Elective for students who did not present German for admission. *1st div., Tu., Wed., Sat., at 9.20; 2d div., Tu., Th., Sat., at 12.20; 3d div., Mon., Tu., Th., at 2.20.*

3, 4. *Elementary Course, Second Year*

Reading of fairly difficult modern German stories, lyrics (von Klenze or Hatfield), and two dramas illustrating respectively the classical and the modern period, for example, Schiller's *Maria Stuart* and Hebbel's *Agnes Bernauer.* Review of grammar; composition; conversation based upon the texts read. *Professor* CROWELL.

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‡ Students wishing recommendations from the department to teach German must pass a special examination designed to test their ability to write and to understand German, and, to some extent, to use the spoken language.

Three hours. Through the year. Elective for students who have credit for 1, 2. *Tu., Wed., Sat., at 9.20.*

5, 6. *Intermediate Course*

Reading of fairly difficult modern German stories, lyrics (von Klenze or Hatfield), and one or two dramas of the classical period. Review of grammar; composition; conversation based upon the texts read. *Messrs.* MITCHELL, BACHMANN, *and* KEENAN.

Three hours. Through the year. Elective for students who have credit for 3, 4, and for Freshmen who presented elementary German for admission. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Tu., Fri., Sat., at 10.20; 3d div., Mon., Wed., Th., at 10.20.*

7, 8. *Advanced Course in Standard Authors, Classical and Modern*

One drama of Goethe or Schiller, one drama of Grillparzer, one drama of Hebbel, von Klenze's *Deutsche Gedichte,* a modern novel like Sudermann's *Frau Sorge.* Talks in German on the history of German literature; oral and written reports in German. *Mr.* BACHMANN.

Three hours. Through the year. Elective for students who have credit for 5, 6, or who have passed 3, 4, with grade B; or who presented intermediate German for admission. *1st div., Mon., Tu., Th., at 11.20; 2d div., Tu., Th., Sat., at 8.*

9, 10. *Modern Prose*

Aims to train the student in reading, speaking, writing, and understanding modern German. Reading of texts selected from history and science; for example, Freytag, Helmholtz, Nichols's *Modern German Prose,* Paszkowski's *Lesebuch zur Einführung in die Kenntnis Deutschlands und seines geistigen Lebens,* 4th ed., and a text (such as Mosher's *Willkommen in Deutschland*) to introduce the student to the actual language of modern daily life. Talks in German; oral and written reports in German; letter-writing, composition, and conversation. *Professor* VON KLENZE *and Mr.* MITCHELL.

Three hours. Through the year. Elective for students who have credit for 5, 6, or who have passed 3, 4, with grade B; or who presented intermediate German for admission. *1st and 2d div., Tu., Fri., Sat., at 10.20.*

[11, 12. *German Lyrical Poetry*]

Introduces the student to the various aspects of the inner life of the German people as reflected in the lyrical poetry of the last two centuries. Lectures in German; oral and written reports in German.

Three hours. Through the year. Elective for students who have credit for 3, 4, or 7, 8, or 9, 10. Not offered in 1913–14.

[13, 14. *The German Short Story*]

The development of the short story into an art form. The study of the "Novelle" as represented by Kleist, Ludwig, Heyse, Storm, C. F. Meyer, Keller, and others, with frequent reference to the chief writers of the short story in France, England, and America. Lectures and reports in German and English.

Three hours. Through the year. Elective for students who have credit for 3, 4, or 7, 8, or 9, 10. Not offered in 1913–14.

15, 16. *The German Drama of the Nineteenth Century*

Kleist, Grillparzer, Hebbel, Hauptmann, and Sudermann. A study of the development of the German drama from waning romanticism to realism, with frequent reference to the chief representatives of the modern drama in other countries. *Mr.* BACHMANN.

Three hours. Through the year. Elective for students who have credit for 3, 4, or 7, 8, or 9, 10. *Tu., Wed. Sat., at 9.20.*

[17, 18. *Lessing and Schiller*]

Aims to introduce the student to the dramatic theory and practice of German classicism. Reading of one or two of Lessing's dramatic works and of several of the representative dramas of Schiller, especially *Wallenstein.* Discussions of the dramatic principles of the Greek and the English drama and of their influence upon Lessing and Schiller, with references to the dramatic theories of the nineteenth century. Lectures and reports in German and English.

Three hours. Through the year. Elective for students who have credit for 7, 8, or 9, 10. Not offered in 1913–14.

21, 22. *Goethe's Faust: Parts* 1 *and* 2

Interpretation of the text; study of the Faust legend and of other English and German dramas which present the Faust problem. Lectures and reports. *Professor* CROWELL.

Three hours. Through the year. Elective for Juniors and Seniors who have credit for 5, 6, and for others by permission. *Tu., Fri., Sat., at 10.20.*

[23, 24. *Goethe: A Study of His Life and Works*]

Lectures in German; reports on assigned topics; extensive reading.

Three hours. Through the year. Elective for students who have credit for 7, 8, or 9, 10. Not offered in 1913–14.

25, 26. *Outline History of German Literature*

Aims to acquaint the student with the most important movements in the evolution of German literary life. Lectures in German; reports on assigned topics; extensive reading. *Professor* VON KLENZE.

Three hours. Through the year. Elective for students who have credit for 7, 8, or 9, 10. *Tu., Th., Sat., at 12.20.*

[27, 28. *German Literature in the Nineteenth Century*]

A study of the literary life of Germany as an expression of German civilization in the nineteenth century. The literary output — Romantic School, Young Germany, Naturalism, Realism, Neo-Romanticism — will be studied, with frequent references to prominent personalities in other domains of intellectual life, such as David Friedrich Strauss, Mommsen, Nietzsche, Wagner. Lectures in German; reports on assigned topics; extensive reading.

Three hours. Through the year. Elective for students who have credit for 7, 8, or 9, 10. Not offered in 1913–14.

[31. *Gothic*]

The Gothic language, with reading of extracts in Streitberg's *Gotisches Elementarbuch* or Braune's *Gotische Grammatik.*

Three hours. First semester. Elective for Graduates and approved Undergraduates. Not offered in 1913–14.

[32. *Old High German*]

Grammar and reading of selections in prose and verse. Some knowledge of Gothic expected. Braune's *Althochdeutsche Grammatik* and Braune's *Althochdeutsches Lesebuch.*

Three hours. Second semester. Elective for Graduates and approved Undergraduates. Not offered in 1913–14.

33. *Old Norse*

Grammar and reading of selections. Holthausen's *Altisländisches Elementarbuch;* Wilken's *Prosaische Edda;* Hildebrand's *Aeltere Edda. Professor* CROWELL.

Three hours. First semester. Elective for Graduates and approved Undergraduates. Students electing Old Norse should also take Germanic Mythology. *Mon., Tu., Th., at 3.20.*

34. *Germanic Mythology*

Primitive Germanic religion, customs, and ideas, in their relations to German literature. Mythological elements in German poetry. Discussions based on E. Mogk's *Germanische Mythologie. Professor* CROWELL.

Three hours. Second semester. Elective for Graduates and approved Undergraduates. *Mon., Tu., Th., at 3.20.*

35, 36. *Middle High German*

The language of the Middle High German period, including an introduction to Germanic philology. Michel's *Mittelhochdeutsches Elementarbuch; Das Nibelungenlied, Minnesangs Frühling, Walter von der Vogelweide.* Lectures in German. Outside reading. *Professor* VON KLENZE.

Three hours. Through the year. Elective for Graduates and approved Undergraduates. *Wed., Fri., Sat., at 11.20.*

41, 42. *Seminary in German Literature*

Aims to give training in modern methods of investigation and criticism. To be conducted in German. *Professor* VON KLENZE.

Three hours. Through the year. Elective for Graduates and approved Undergraduates.

XIII. GREEK LITERATURE AND HISTORY

JAMES IRVING MANATT, PH.D., LL.D., *Professor of Greek Literature and History*

FRANCIS GREENLEAF ALLINSON, PH.D., *David Benedict Professor of Classical Philology*

——————————, *Instructor in Greek*

A, B. *Elementary Course*

Designed to cover as much as possible of the entrance requirements, and thus to enable a student to take 1 in the following year if he completes by private study before the opening of the first semester the requirement in Homer, and before the opening of the second semester the requirement in the *Anabasis. Mr.* ——.

Three hours. Through the year. Elective for students who did not present elementary and advanced Greek for admission. *Tu., Th., Sat., at 12.20.*

1. *Homer and the Greek Anthology*

Six books of the *Odyssey* in the original, with a general survey of the entire poem. Selections from the Elegiac, Iambic, and Lyric Poets. *Professor* MANATT.

Three hours. First semester. Elective for students who presented elementary and advanced Greek for admission, or who have credit for A, B, and have done the additional work indicated above. *Tu., Th., Sat., at 12.20.*

2. *Plato and Lysias*

Plato: *Apology* and *Crito,* with selections from *Phaedo,* and collateral readings from Xenophon's *Memorabilia* and the *Clouds* of Aristophanes. Lysias: *Orations* VII, XXII, XXIII, XXIV, with collateral reading of Xenophon's *Hellenica,* II. *Professor* ALLINSON.

Three hours. Second semester. Elective for students who have credit for 1. *Tu., Th., Sat., at 12.20.*

3. *Lucian and the Dramatic Poets*

Selections from Lucian. Lectures on the Greek drama. The *Oedipus Tyrannus* of Sophocles and collateral reading in the *Prometheus* of Aeschylus. *Professor* ALLINSON.

Three hours. First semester. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

4. *The Historians*

The eighth book of Herodotus, with collateral reading of the *Persians* of Aeschylus and Plutarch's *Themistocles.* The seventh book of Thucydides, with collateral reading of Plutarch's *Pericles* and *Nicias. Professor* MANATT.

Three hours. Second semester. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

5. *Epic Poetry*

The *Iliad,* XVIII-XXIV, with a general study of the poem as a whole. Hesiod: selections from the *Theogony* and the *Works and Days.* Selected Homeric Hymns. *Professor* MANATT.

Three hours. First semester. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

6. *The Drama*

Menander. Aeschylus: *Seven against Thebes.* Euripides: *Medea.* Aristophanes: *Frogs. Professor* ALLINSON.

Three hours. Second semester. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

[7. *Lyric and Pastoral Poetry*]

Pindar: selected Olympian and Pythian Odes. Bacchylides, v, xvii, xviii. Theocritus: twelve *Idylls.*

Three hours. First semester. Elective for Juniors and Seniors. Not offered in 1913–14.

[8. *Plato, Aristotle, and Aeschylus*]

Plato: selections from the *Republic.* Aristotle: the *Constitution of Athens.* Aeschylus: the *Agamemnon,* with collateral reading of the rest of the *Oresteia.*

Three hours. Second semester. Elective for Juniors and Seniors. Not offered in 1913–14.

[9. *The Attic Orators*]

Selected speeches of Isaeus, Aeschines, and Demosthenes.

Three hours. First semester. Elective for Juniors and Seniors. Not offered in 1913–14.

[10. *Lucian and Pausanias*]

Three hours. Second semester. Elective for Juniors and Seniors. Not offered in 1913–14.

12. *Greek Composition*

Professor Allinson.

One hour. Second semester. Elective for Sophomores, Juniors, and Seniors.

[13, 14. *Modern Greek*]

Introduction to the language; readings from living Greek authors and Greek newspapers; conversation.

One hour. Through the year. Elective for Sophomores, Juniors, and Seniors. Not offered in 1913–14.

15. *Greek Civilization*

The life of the Greeks from Homer to the second century after Christ, with special study of the political, social, and religious institutions of the classical period as illustrated by the literature, history, and monuments of art. Must be followed in the second semester by Latin 16, Roman Civilization. The two semesters together constitute the course in Classical Civilization. *Professor* Allinson.

Three hours. First semester. Required in the Freshman or Sophomore year of all candidates for the degree of Bachelor of Philosophy. Not elective. *1st div., Mon., Th., Fri., at 9.20; 2d div., Mon., Tu., Th., at 11.20.*

17, 18. *Greek Seminary*

First semester, Aristophanes and the Comic Fragments, or Comparative Philology. (*See* Indo-European Philology 4.) *Professor* ALLINSON. Second semester, Pindar: Isthmian and Nemean Odes. *Professor* MANATT.

Three hours. Two hours of attendance. Through the year. Elective for Graduates and approved Seniors.

XIV. HISTORY‡

WILLIAM MACDONALD, PH.D., LL.D., *George L. Littlefield Professor of American History*

THEODORE FRELINGHUYSEN COLLIER, PH.D., *Associate Professor of History*

1, 2. *Medieval and Modern History of Europe*

A general survey of the history of western Europe from the time of the barbarian invasions to the present. A narrative text-book supplemented by lectures, frequent written tests, written reports and abstracts on assigned reading, and topics for special investigation. *Professor* MACDONALD.

Three hours. Through the year. Required of candidates for the degree of Bachelor of Arts in the Sophomore or Junior year, and of candidates for the degree of Bachelor of Philosophy in the Freshman, Sophomore, or Junior year. *Mon., Tu., Th., at 2.20.*

3. *Early and Medieval Christianity*

A study of the development of Christian thought and institutions from the Apostolic age to the Reformation, with especial attention to the internal life of the church rather than to its external political relations. Lectures and parallel reading, with frequent assignments in the sources. *Professor* COLLIER.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. With 4 constitutes a continuous year course in Church history. *Tu., Th., Sat., at 12.20.*

‡ The elective courses in History are regularly open only to students who have credit for 1, 2, but by special permission of the instructor elective courses may be taken by students who are at the same time taking 1, 2.

4. *The Reformation*

The causes of the Reformation; the Lutheran revolt; Calvinism; the Church of England; the Roman Catholic reaction and the religious wars; with a brief survey of the parallel doctrinal development. Method as in 3. *Professor* Collier.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates who have credit for 3 and for others by special permission. *Tu., Th., Sat., at 12.20.*

5. *The French Revolution and the Napoleonic Era*

An introductory survey of the eighteenth century, with particular reference to the causes of the French Revolution, followed by a detailed study of the Revolution, its principles and development, and the rise and overthrow of Napoleon. *Professor* Collier.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. With 6 constitutes a continuous year course in modern European history. *Tu., Fri., Sat., at 10.20.*

6. *Europe since 1815*

The reconstruction of Europe after Napoleon; reaction and revolution; political reorganization, and the formation of the present states of Europe; colonial expansion and world-politics ; social development. *Professor* Collier.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. A continuation of 5, by which it should preferably be preceded. *Tu., Fri., Sat., at 10.20.*

7. *English History to 1603*

A general course in the history of England from the Roman occupation to the close of the reign of Elizabeth. Lectures, parallel reading, frequent tests, and regular assignments in the sources, with written or oral reports. *Professor* Collier.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates, and for Sophomores who have credit for 1, 2. *Mon., Tu., Th., at 2.20.*

8. *English History, 1603 to the present time*

A continuation of course 7, following the same method. In the study of the eighteenth and nineteenth centuries particular attention will be paid to the social development; the diplomatic relations of England with the Continental powers will, for the most part, be taken up in 6. *Professor* Collier.

Three hours. Second semester. Elective for Sophomores, Juniors, Seniors, and Graduates who have credit for 7 and for others by special permission. *Mon., Tu., Th., at 2.20.*

11, 12. *Seminary in European History*

Intensive study of a limited period or of a special phase of social or political development, with a view to training in historical method and the use of the sources. For 1913–14 the subjects are: First semester, The benevolent despotism of the eighteenth century. Second semester, Church and state in the nineteenth century. *Professor* COLLIER.

Three hours. Two hours of attendance. Through the year. Elective for Graduates and approved Juniors and Seniors.

13, 14. *American History*

A general course, covering the whole period from the beginnings of English colonization to the present time. Intended as an introduction to the advanced courses in American history and for students who wish only a general survey of the subject. *Professor* MACDONALD.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently, but 14 should preferably be preceded by 13. *Wed., Fri., Sat., at 11.20.*

[15, 16. *Constitutional and Political History of the United States*]

An advanced course covering the period from 1783 to the present time. Intended primarily for students who wish to specialize in American history or who expect to study law.

Three hours. Two hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates. Not offered in 1913–14.

17, 18. *Seminary in American History*

Designed to afford training in historical investigation and practice in the use of sources. The subjects vary from year to year, and are drawn from both the colonial and the constitutional periods. For 1913–14 the subjects are: First semester, The expansion of New England. Second semester, The history of the Federalist party and of Federalism. *Professor* MACDONALD.

Three hours. One to two hours of attendance. Through the year. Elective for Graduates and approved Seniors. Should be preceded by 13, 14, or 15, 16, or 19, 20, but in exceptional cases may be taken by students who at the same time are taking one of these groups of courses.

19. *Social History of America to 1787*

The historical development of political, social, and religious institutions in the colonial and revolutionary periods. *Professor* MacDonald.

Three hours. Two hours of attendance. First semester. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., at 12.20.*

20. *History of the United States since 1860*

A narrative course dealing especially with legal and constitutional development, party changes, and international relations. Intended primarily for students who wish to specialize in American history or who expect to study law. *Professor* MacDonald.

Three hours. Two hours of attendance. Second semester. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., at 12.20.*

XV. INDO-EUROPEAN PHILOLOGY

Francis Greenleaf Allinson, Ph.D., *David Benedict Professor of Classical Philology*

2. *General Introduction to the Study of Language*

Outline of the history of language; the Indo-European family. Adapted for students of ancient or modern languages.

Three hours. Second semester. Elective for Undergraduates.

4. *Seminary in Comparative Philology*

For advanced students in Greek and Latin or modern languages.

Three hours. Two hours of attendance. First semester. Elective for Graduates and approved Seniors.

5, 6. *Sanskrit, Elementary Course*

Whitney's *Grammar;* Lanman's *Reader;* selections from the *Vedic Hymns.*

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

[7, 8. *Sanskrit, Advanced Course*]

Vedic Hymns, and other selections.

One hour. Through the year. Elective for students who have credit for 5, 6. Not offered in 1913–14.

XVI. MATHEMATICS

Nathaniel French Davis, A.M., LL.D., *Professor of Pure Mathematics*

Henry Parker Manning, Ph.D., *Associate Professor of Pure Mathematics*

Roland George Dwight Richardson, Ph.D., *Associate Professor of Pure Mathematics*

Raymond Clare Archibald, Ph.D., *Assistant Professor of Pure Mathematics*

Clinton Harvey Currier, A.M., *Instructor in Mathematics*

INTRODUCTORY STATEMENT‡

For students who presented only Algebra and Plane Geometry for admission. Candidates for the degree of Bachelor of Arts, and candidates for the degree of Bachelor of Philosophy who do not intend to take Argumentation in the Sophomore year, are required to take one of the following combinations of courses: (A) 1, 2; (B) 3, 4; (C) 3, 2. Students who intend to specialize in Mathematics are advised to take both 1, 2 and 3, 4, or 13, 16 and 17, 18; but if only three hours can be taken in the Freshman year, it is advisable to elect 3, 2.

For students who presented Solid Geometry and Plane Trigonometry for admission. Candidates for the degree of Bachelor of Arts, and those candidates for the degree of Bachelor of Philosophy who do not elect to take Argumentation in the Sophomore year, are required to take one of the following combinations of courses: (A) 3, 4; (B) 5, 6; (C) 5, 4. Students who intend to specialize in Mathematics are advised to take both 3, 4 and 5, 6; but if only one course can be taken in the Freshman year, it is advisable to elect 5, 6.

1. *Solid and Spherical Geometry*

Professors Manning *and* Archibald, *Mr.* Currier.

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‡ Students wishing to specialize in Mathematics should take the undergraduate courses in the order 3, 2, 5, 6, 7, 8, 9. Courses 1, 4, 16, together with as many of courses 21-44 as possible, should be taken as opportunity offers in connection with the other courses.

It is recommended that students who contemplate teaching in the secondary schools elect courses 1-8, 41, 42, 43, 44.

Courses 9, 13, 16, 17, 18, 19, 20 are primarily for candidates for the degree of Bachelor of Science.

Courses 21-32 are designed primarily for Graduates. Two or three of these courses are offered each year according to the needs of students. For those who have taken all of them, other courses can usually be arranged.

Unless elected by three students, courses 21-32, 41-44 may not be given.

Three hours. First semester. Required as noted in Introductory Statement. Elective for other Undergraduates who did not present Solid Geometry for admission. *One division, Mon., Wed., Fri., at 8 ; two divisions, Mon., Th., Fri., at 9.20; two divisions, Tu., Wed., Sat., at 9.20.*

2. *Plane Trigonometry*

Professors DAVIS, MANNING, *and* ARCHIBALD, *Mr.* CURRIER.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for other Undergraduates who did not present Plane Trigonometry for admission. *One division, Mon., Wed., Fri., at 8; two divisions, Mon., Th., Fri., at 9.20; two divisions, Tu., Wed., Sat., at 9.20.*

3. *Algebra*

Professor MANNING *and Mr.* CURRIER.

Three hours. First semester. Required as noted in Introductory Statement. Elective for other Undergraduates. *One division, Mon., Th., Fri., at 9.20; one division, Tu., Wed., Sat., at 9.20.*

4. *Algebra*

Professor MANNING.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for students who have credit for 3. *Mon., Th., Fri., at 9.20.*

5. *Plane Analytic Geometry*

Professor DAVIS.

Three hours. First semester. Required as noted in Introductory Statement. Elective for students who have credit for Plane Trigonometry. *Tu., Wed., Sat., at 9.20.*

6. *Differential Calculus*

Professor DAVIS.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for students who have credit for 5. *Tu., Wed., Sat., at 9.20.*

7, 8. *Differential and Integral Calculus*

A continuation of 6. *Professor* DAVIS *and Mr.* CURRIER.

Three hours. Through the year. Elective for students who have credit for 6. *Tu., Th., Sat., at 12.20.*

9. *Differential Equations*

Professor MANNING.

Two hours. First semester. Required of candidates for the degree of Bachelor of Science in Electrical Engineering. Elective for students who have credit for 8 or 20. *Tu., Th., at 12.20.*

[12. *Modern Analytic Geometry*]

Three hours. Second semester. Elective for students who have credit for 5. Not offered in 1913–14.

13. *Advanced Algebra*

Professors MANNING, RICHARDSON, *and* ARCHIBALD, *Mr.* CURRIER.

Three hours. First semester. Required of candidates for the degree of Bachelor of Science. *Wed., Fri., Sat., at 11.20.*

[14. *Solid Analytic Geometry*]

Three hours. Second semester. Elective for students who have credit for 5. Not offered in 1913–14.

16. *Spherical Trigonometry*

Professors DAVIS *and* MANNING.

One hour. Second semester. Required of candidates for the degree of Bachelor of Science. Elective for students who have credit for Plane Trigonometry, and have not taken Spherical Trigonometry in college. *Two divisions, Wed. at 11.20; one division, Sat. at 11.20.*

17. *Plane Trigonometry*

Professors DAVIS, RICHARDSON, *and* ARCHIBALD, *Mr.* CURRIER.

Three hours. First semester. Required of candidates for the degree of Bachelor of Science. *Mon., Tu., Th., at 11.20.*

18. *Analytic Geometry*

Professors RICHARDSON *and* ARCHIBALD, *Mr.* CURRIER.

Five hours. Second semester. Required of candidates for the degree of Bachelor of Science. *One division, Mon., Tu., Wed., Th., Fri., at 11.20; two divisions, Mon., Tu., Th., Fri., Sat., at 11.20.*

19, 20. *Differential and Integral Calculus*

Professors DAVIS *and* RICHARDSON.

Four hours. Through the year. Required of candidates for the degree of Bachelor of Science. *One division, Tu., Wed., Sat., at 9.20, Th. at 8; one division, Tu., Fri., Sat., at 10.20, Wed. at 8.*

21, 22. *Function Theory of a Complex Variable*

Professor MANNING.

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors. *Tu., Th., Sat., at 8.*

[23, 24. *Differential Equations, Advanced Course*]

Three hours. Through the year. Elective for Graduates who have credit for 21, 22. Not offered in 1913–14.

[25, 26. *Advanced Algebra*]

Among the subjects discussed are the following: linear dependence; systems of linear equations; linear transformations; algebraic invariants; bilinear and quadratic forms; factoring of polynomials in one and in several variables.

Three hours. Through the year. Elective by special permission of the instructor. Not offered in 1913–14.

[27, 28. *Projective Geometry*]

Three hours. Through the year. Elective for Graduates and approved Seniors. Not offered in 1913–14.

[29, 30. *Function Theory of a Real Variable*]

The foundations of the differential calculus; definite integrals; line integrals; multiple integrals; infinite series.

Three hours. Through the year. Elective for students who have credit for 25, 26, and for others by special permission. Not offered in 1913–14.

31, 32. *Applications of Calculus to Geometry*

Professor ARCHIBALD.

Three hours. Through the year. Elective for students who have credit for 8 or 20.

41, 42. *Fundamental Problems of Algebra*

An introduction to some of the concepts of modern analysis; designed for students who expect to teach as well as for those who are preparing for advanced work in Mathematics. Among the topics to be treated are: the number system; limits; infinite series; the fundamental operations; determinants and systems of linear equations. *Professor* RICHARDSON.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon., Wed., Fri., at 8.*

[43, 44. *Foundations, Methods, and Problems of Geometry*]
Designed for those who expect to teach Mathematics. The principal subjects included in the course will be: foundations (considerable time will be devoted to this topic); Euclid and his modern rivals; American, English, French, German, and Italian texts; Euclidean, Mascheronian, and Steinerian constructions; methods for problem solving; geometrography; famous problems; history.

Three hours. Through the year. Elective for students who have credit for 3, 4, or 25, 26, or 41, 42, and for others by special permission. Not offered in 1913–14.

XVII. MECHANICAL ENGINEERING‡

William Herbert Kenerson, M.E., A.M., *Professor of Mechanical Engineering*

Thurston Mason Phetteplace, M.E., A.M., *Assistant Professor of Mechanical Engineering*

Henry Dewees Cady, *Instructor in Shop Practice*

James Alexander Hall, A.B., Sc.B., *Instructor in Mechanical Engineering*

1. *Wood-work*
Exercises in carpentry and wood-turning. Assigned reading and written reports. *Mr.* Cady.

Two hours. Five hours of attendance. First semester. *Tu., 2 to 5; Fri., 2 to 4.*

2. *Wood-work*
Exercises in pattern-making. Assigned reading and written reports. *Mr.* Cady.

Two hours. Five hours of attendance. Second semester. *Mon., Th., 2 to 4; Wed. at 11.20.*

3, 4. *Metal-work*
Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. Assigned reading and written reports. *Mr.* Cady.

Two hours. Five hours of attendance. Through the year. First semester, *Mon. at 10.20; Tu., Fri., 2 to 4.* Second semester, *Wed., 2 to 4; Fri., 2 to 5.*

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‡ All the courses in this department except 6 and 7 are required of candidates for the degree of Bachelor of Science in Mechanical Engineering, and, with the exception of 1-5, are elective for other students.

5. *Metal-work*

Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. Assigned reading and written reports. *Mr.* CADY.

Three hours. Seven hours of attendance. First semester. *Tu., Fri., 2 to 5; Fri. at 9.20.*

6. *Wood-work*

Exercises in carpentry, wood-turning, and pattern-making. *Mr.* CADY.

Three hours. Seven hours of attendance. Elective in either semester for Sophomores, Juniors, and Seniors, who have had instruction in drawing. First semester, *Tu., Fri., 2 to 5.* Second semester, *Mon., Th., 2 to 5.*

7. *Metal-work*

Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. *Mr.* CADY.

Three hours. Seven hours of attendance. Elective in either semester for Sophomores, Juniors, and Seniors who have had instruction in drawing. First semester, *Tu., Fri., 2 to 5.* Second semester, *Mon., Th., 2 to 5.*

8. *Kinematics*

Velocity ratios, rolling surfaces, cams, and belting. Recitations, drawing, and the solution of problems. *Professor* PHETTEPLACE.

Three hours. Seven hours of attendance. Second semester. Elective for students who have credit for Mechanical Drawing 5. *Tu. at 12.20 and 2.20 to 5.20; Fri., 2.20 to 5.20.*

9, 10. *Kinematics, continued*

Gearing, linkwork, parallel motions, and gear trains; machine tools; the application of the principles involved. Recitations, drawing, and the solution of problems. *Professor* PHETTEPLACE.

Three hours. Seven hours of attendance. Through the year. Elective for students who have credit for 8 and for Mechanical Drawing 5. *Mon., 2.20 to 5.20; Wed. at 10.20; Th., 2.20 to 5.20.*

11, 12. *Machine Design*

Applications of the principles of mechanics and the strength of materials to the design of representative types of boilers, engines, and various mechanisms; solution of problems illustrating the method of designing bolts and nuts, keys, journals and bearings, fly-wheels, valve-gears, etc. Lectures, calculation, and drawing. *Professor* PHETTEPLACE.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 9, 10, and Mechanics 2. *Mon., Th., 10.20 to 1.20.*

14. *General Engineering and Design*

Lectures; discussion of special engineering problems, patents and patent law, and cost systems. *Professors* KENERSON *and* PHETTEPLACE.

Two hours. Second semester. *Tu., Wed., 10.20 to 12.20.*

15, 16. *Thermodynamics*

Applications of the principles of gases and vapors to steam, gas, and other heat engines, air-compressors, refrigerating apparatus, etc.; discussion of the energy of fuel and the utilization of such energy for power purposes by means of various media; laws of the relation of variations of pressure, temperature, and volume of such media; analysis of the various cycles used in heat engines; the principles of the injector and the ejector. *Professor* KENERSON *and Mr.* HALL.

Three hours. Through the year. Elective for students who have credit for Physics 1, 2. *Tu., Wed., Sat., at 9.20.*

17, 18. *Engineering Practice*

Applications of the principles of thermodynamics and mechanics to the production, transmission, utilization, and measurement of power; valves and valve gears, and valve setting; indicator practice and tests of various forms of steam engines, gas engines, etc.; standardization of auxiliary apparatus used in making the various tests; boiler testing; flue gas and fuel analysis, etc. Lectures, recitations, and laboratory work. *Professor* KENERSON *and Mr.* HALL.

Three hours. Through the year. Elective for students who have credit for or are taking 15, 16. *Wed., Fri., Sat., at 8.*

19, 20. *Materials of Engineering*

Study of the sources, manufacture, and properties of the important materials used in engineering; laboratory tests to determine the behavior of materials when subjected to tensile, compressive, and torsional stresses; mixing and testing of cements and mortars; preparation and examination of sections for the microscopical study of the structure of metals and alloys. Lectures, recitations, and laboratory work. *Professor* KENERSON *and Mr.* HALL.

Three hours. Through the year. Elective for students who have credit for or are taking Mechanics 1. *Tu., Fri., at 10.20. 1st div., Mon., 9.20 to 11.20; 2d div., Tu., 3.20 to 5.20; 3d div., Th., 3.20 to 5.20; 4th div., Mon., 3.20 to 5.20.*

21. *Power Plant Engineering*

Discussion of the relation and coördination of the various parts of the complete power plant; management, and methods of determining efficiency; selection of the best equipment from manufacturers' catalogues and actual inspection. Lectures, recitations, tests, and tours of inspection. *Professor* PHETTEPLACE.

Three hours. First semester. Elective for students who have credit for 15, 16. *Tu., Fri., 2.20 to 5.20; Wed., Sat., at 9.20.*

22. *Advanced Laboratory Course*

Steam, gas, and power engineering. Particular emphasis laid on preparation and form of reports. *Professor* KENERSON *and Mr.* HALL.

Three hours. Second semester. *Tu., Fri., 2 to 5.*

24. *Applied Hydraulics*

Laboratory experiments in connection with Mechanics 4. *Professor* KENERSON.

One hour. Second semester. Must be taken with Mechanics 4 and Civil Engineering 34.

25, 26. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Mechanical Engineering. The thesis must embody a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XVIII. MECHANICS AND MECHANICAL DRAWING

Otis Everett Randall, Ph.D., *Professor of Mechanics and Mechanical Drawing*

Ansel Brooks, Ph.B., M.E., *Associate Professor of Mechanics and Mechanical Drawing*

John Joseph Long, Ph.B., *Instructor in Mechanical Drawing*

MECHANICS

1, 2. *Mechanics of Solids*

Statics, including resolution and composition of forces, determination of center of gravity, and problems relative to rigid bodies and flexible cords; dynamics, including rectilinear and curvilinear motion, virtual velocity, moment of inertia, work, energy and power, and friction; strength of materials, including tension, compression, shearing, torsion, and flexure; methods of graphical solution of problems. *Professors* Randall *and* Brooks.

Four hours. Through the year. Required of candidates for the degree of Bachelor of Science. Elective for students who have credit for Mathematics 7, 8. *Mon., Tu., at 11.20; Th., 10.20 to 12.20.*

3. *Mechanics of Fluids*

Hydrostatics; nature and use of instruments; flow through orifices, over weirs, through tubes, through pipes, in conduits; flow of rivers; water supply and water power. *Professors* Randall *and* Brooks.

Three hours. First semester. Required of candidates for the degree of Bachelor of Science. Elective for students who have credit for 1, 2. *Wed., Fri., Sat., at 11.20.*

4. *Applied Hydraulics*

Dynamics of water; theoretical consideration of water wheels, pumps, and pumping machinery. *Professors* Randall *and* Brooks.

One hour. Second semester. Required of candidates for the degree of Bachelor of Science. Elective for students who have credit for 3. Must be taken with Civil Engineering 34, and Mechanical Engineering 24. *Wed. at 11.20.*

5, 6. *Mathematical Mechanics*

Comprehensive treatment of the principles of statics and dynamics; strength of materials; higher theoretical and practical problems. Intended primarily for students who are interested in the application of the principles of pure mathematics. *Professor* Brooks.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for Mathematics 7, 8.

MECHANICAL DRAWING

1, 2. *Elementary Mechanical Drawing*

Nature, care, and use of drafting instruments; lettering; plane problem construction; curve tracing; elementary projection. *Professor* Brooks *and Mr.* Long.

Two hours. Four hours of drawing. Through the year. Required in the Freshman year of candidates for the degree of Bachelor of Science. *Tu., Fri., 2.20 to 4.20.*

3, 4. *Descriptive Geometry*

Discussion, proof, and graphic solution of problems relating to the point, line, and plane, line and surface generation and classification, surface tangency, intersections, and developments; application of the principles of descriptive geometry in isometric drawing, shades and shadows and perspective, machine drawing, and practical engineering problems. *Professor* Brooks *and Mr.* Long.

Three hours. Two hours of recitation and three hours of drawing. Through the year. Required in the Sophomore year of candidates for the degree of Bachelor of Science. Elective for students who have credit for 7, 8. *Mon., Tu., Th., Fri., Sat., at 9.20; Tu., Sat., at 10.20.*

5. *Machine Drawing*

Study and representation of machine parts; the principles of elementary machine design; sketches, detail, and assembly drawings of machines; practice in reading drawings. *Professor* Brooks *and Mr.* Long.

Three hours. One hour of recitation and six hours of drawing. First semester. Required of candidates for the degree of Bachelor of Science in Mechanical Engineering or Electrical Engineering. Elective for students who have credit for 7, 8. *Tu. at 12.20; Mon., Th., 2.20 to 5.20.*

7, 8. *Elementary Mechanical Drawing*

Nature, care, and use of drafting instruments; lettering; plane problem construction; curve tracing; elementary projection. *Mr.* Long.

Three hours. Six hours of drawing. Through the year. Elective for Undergraduates. *Tu.*, *Fri.*, *2.20 to 4.20*.

XIX. MUSIC

HAMILTON CRAWFORD MACDOUGALL, MUS.D., *Lecturer in Music*

1, 2. *The Evolution of Modern Music*

A general course, taking up modern composers and their works from Haydn to Wagner and Richard Strauss. Lectures, illustrations on the piano, assigned readings, and papers. Designed to give power of appreciation and interpretation with the minimum of technical detail.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. No previous knowledge of music required. *Mon.*, *Wed.*, *at 12.20*, and a third hour at the pleasure of the instructor.

XX. PHILOSOPHY

WILLIAM HERBERT PERRY FAUNCE, A.M., D.D., LL.D., *Professor of Moral and Intellectual Philosophy*

EDMUND BURKE DELABARRE, PH.D., *Professor of Psychology*

WALTER GOODNOW EVERETT, PH.D., *Professor of Philosophy and Natural Theology*

ALFRED HARRISON JONES, PH.D., *Assistant Professor of Logic*

HARRIS MERRILL BARBOUR, A.B., B.D., *Assistant in Philosophy*

1, 2. *Logic*

The aims, methods, and principles of thought; designed to introduce the student to the study of philosophy through a criticism of the nature and limits of the special sciences and philosophy, and an estimate of their validity for religion and life. *Professor* JONES.

Three hours. Through the year. Elective for Sophomores and Juniors. *Mon.*, *Th.*, *Fri.*, *at 9.20.*

3, 4. *Psychology and Ethics*

First semester, Psychology. A survey of the main facts and laws of mental life, aiming to provide a sound foundation for further acquaintance with this and allied subjects, for an improved judgment in dealing with many practical problems, and for understanding the psychological bases of philosophy. Second semester, Ethics. An introductory course dealing in a concrete way with the moral values of daily experience, and intended to aid the student in forming a practical philosophy of life. First semester, *Professor* Delabarre. Second semester, *Professor* Everett.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Either semester may be elected independently by Seniors only. *Tu., Wed., Sat., at 9.20.*

5, 6. *Psychology, Intermediate Course*

A study of the fundamental principles on which a scientific system of psychology must be based. The nature and composition of consciousness, its relation to bodily processes, and its complete subjection to law. The criteria for accepting evidence and forming sound judgments in connection with the problems of so-called "psychical research." *Professor* Delabarre.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for a course in Psychology.

7, 8. *History of Philosophy*

The successive philosophical systems as revealing the logical development of European philosophy. The treatment also aims to exhibit the significant relations which philosophy has sustained to civilization, especially in its fundamental political, scientific, religious, and cultural elements. *Professor* Everett.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

9. *Philosophy of Religion*

A study of the nature of the religious consciousness, and of the ultimate problems of religious psychology and belief. *Professor* Everett.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates who have credit for a year course in Philosophy. *Tu., Wed., Sat., at 9.20.*

10. *Applications of Psychology*

Description of some of the important ways in which the principles of psychology are being practically applied to the problems of modern life. *Professor* Delabarre.

Three hours. Second semester. Elective for students who have credit for 3. *Tu., Wed., Sat., at 9.20.*

11, 12. *Experimental Psychology, Introductory Laboratory Course*
Description of the main lines and results of experimental research; demonstrations by the instructor or the class; training in the use of apparatus and in careful scientific observation and measurement. *Professor* DELABARRE.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3.

13, 14. *Problems of Philosophy*
A study of some of the more important types of philosophical theory, such as mechanism, dualism, subjective idealism, pragmatism, and realism, and an attempt to estimate their validity for constructive thinking. A large part of the second semester will be devoted to a discussion of the forms and philosophical significance of the theory of evolution. *Professor* JONES.

Three hours. Through the year. Elective for Juniors and Seniors who have credit for a year course in Philosophy or who are taking 7, 8, and for Graduates.

25, 26. *Modern Pragmatism*
A study of pragmatism, as represented especially by James and Dewey, and of the philosophy of Bergson; an attempt to estimate the significance of some of the more important anti-intellectualistic tendencies of recent philosophy. *Professor* JONES.

Three hours. Through the year. Elective for Seniors who have credit for 7, 8, and for Graduates.

17, 18. *Psychology, Advanced Course*
A seminary for the discussion of important problems in psychology. The problems discussed will vary, and the course may be taken for two or more years. *Professor* DELABARRE.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 5, 6.

19, 20. *Experimental Psychology, Advanced Laboratory Course*
The aim is to study further the problems of experimental psychology, and, whenever possible, to make original contributions to scientific knowledge. The problems investigated will vary, and the course may be taken for two or more years. *Professor* DELABARRE.

One to six hours. Two to twelve hours of attendance. Through the year. Elective for students who have credit for 11, 12. May be taken for more than six hours by Graduates.

21, 22. *Advanced Ethics*

A seminary course for the study of the more important problems of ethical theory. Lectures, written reports, and discussions. Subject for 1913–14: Present Day Ethical Problems. *Professor* Everett.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for a year course in Philosophy. [This year for Graduates only.]

[23, 24. *Philosophical Seminary*]

A seminary for the study of the problems of historical and contemporary thought. Reading, written reports, and discussions.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for a year course in Philosophy. Not offered in 1913–14.

XXI. PHYSICS

Carl Barus, Ph.D., LL.D., *Hazard Professor of Physics*
Albert deForest Palmer, Ph.D., *Associate Professor of Physics*
Arthur Eugene Watson, Ph.D., *Assistant Professor of Physics*
Robert Franklin Field, A.M., *Instructor in Physics*

1, 2. *Elementary Physics* ‡

Designed for those who have had little previous training in physics. First semester, dynamics, molecular physics, and heat. Second semester, optics, acoustics, and electricity. The more elementary features of the subjects discussed. Lectures illustrated by experiments and the lantern; weekly written exercises. *Professor* Barus.

Three hours. Through the year. Required of all candidates for the degree of Bachelor of Science. Elective for Undergraduates who have credit for entrance algebra and plane geometry. *Mon., Wed., Th., at 10.20.*

3, 4. *Elementary Physics, continued* §

Treats the more advanced parts of the subjects taken in the same order as in the preceding course. *Professor* Barus.

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‡ Students who intend to teach Physics should elect courses 1, 2; 3, 4; 5, 6.

§ Graduates taking course 3, 4 are held responsible for all the demonstrations, or for the full equivalent of either Watson's or Daniel's *Principles of General Physics.*

Three hours. Through the year. Elective for students who have credit for 1, 2, and Mathematics 1, 2. *Tu., Fri., Sat., at 10.20.*

5, 6. *Experimental Physics*

An introduction to the theory and practice of physical manipulation. Experimental study of physical phenomena selected to meet the needs of individual students. Written reports and solution of problems. *Professor* PALMER.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2.

7, 8. *Mathematical Treatment of Dynamical Problems* ‡

First semester, discussion of the general principles of dynamics and the development of the general equations of motion. Second semester, application of these principles to special problems in thermodynamics and hydrodynamics. *Professor* PALMER.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 5, 6, and Mathematics 9, 10.

9, 10. *Mathematical Theory of Electricity and Magnetism* ‡

Includes a discussion of the more important problems of electrical science. *Professor* PALMER.

Three hours. Through the year. Elective for Graduates and Seniors who have credit for 5, 6, and Mathematics 9, 10.

11, 12. *Advanced Laboratory Course*

Special problems and reference to original sources for methods of solution. *Professors* BARUS, PALMER, *and* WATSON.

Three or six hours. Six or twelve hours of attendance. Through the year. Elective for students who have credit for 5, 6.

13, 14. *Applied Harmonic Analysis and Applied Vector Analysis* §

Importance of Fourier's method shown by examples drawn from the analytical theory of heat, from elastics, alternating electricity, and elsewhere; treatment by the aid of spherical harmonics. Bessel functions and Lamé functions; the chief theorems of vector analysis deduced and applied to dynamics, elastics, hydrodynamics, the electro-magnetics of Maxwell and Hertz, and the electronic theory of Heaviside, Lorentz, and others. *Professor* Barus.

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‡ In determining which of the two courses 7, 8, and 9, 10, shall be offered in any given year, the preference of students will be considered.

§ In determining the content of courses 13, 14, and 15, 16, the preference of students will be considered.

Three hours. Through the year. Required in the second semester of candidates for the degree of Bachelor of Science in Electrical Engineering. Elective for Seniors and Graduates who have credit for 1, 2, and Mathematics 7, 8.

15, 16. *Physics, Advanced Course* ‡

Lectures on dynamics, potential, elastics, hydrostatics, hydrodynamics, viscosity, capillarity, electrostatics, magnetism, electro-magnetism, thermo-electrics, induction, Fresnel's optics, the electromagnetic theory of light, thermal analytics, and thermodynamics. *Professor* Barus.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for Mathematics 7, 8.

21, 22. *Theory of Measurements*

Lectures and recitations on the theory and precision of measurements, and on methods of taking, recording, and reducing observations; laboratory instruction in selected physical measurements. *Professor* Palmer.

Three hours. Five hours of attendance. Through the year. Required of candidates for the degree of Bachelor of Science. Elective for students who have credit for 1, 2, and Mathematics 7, 8, or 19, 20. *Mon., Fri., at 12.20.* Laboratory hours will be posted in 11 Wilson Hall on the first day of each term.

23, 24. *Precision Measurements in Photometry, Electricity, and Magnetism*

Professor Palmer.

Four hours. Eight hours of attendance. Through the year. Elective for students who have credit for 5, 6, or 21, 22, and Mathematics 7, 8, or 19, 20.

25, 26. *Radiation, Optics, and Heat*

Experimental study of selected phenomena; demonstrations and personal conferences. *Professor* Palmer.

Three or six hours. Six or twelve hours of attendance. Through the year. Elective for students who have credit for 5, 6, or 21, 22.

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‡ In determining the content of courses 13, 14, and 15, 16, the preference of students will be considered.

ELECTRICAL ENGINEERING‡

Professor Watson *and Mr.* Field

1, 2. *General Course*

Methods of generating and utilizing electric currents; theory and working of dynamo-electric machinery.

Three hours. Two hours of recitation or lecture and two hours in the laboratory. Elective for students who have credit for or are taking Physics 5, 6, or 21, 22, and Mathematics 6 or 19. First semester, *Mon.*, *Th.*, *at 9.20.* Second semester, *Mon.*, *Fri.*, *at 9.20.* Laboratory assignments for afternoons.

3, 4. *Alternating Currents*

Mathematical and graphical treatment.

Three hours. Two hours of recitation or lecture and two hours in the laboratory. Through the year. Elective for students who have credit for 2, and who have credit for or are taking Mathematics 9. *Tu.*, *Fri.*, *at 10.20.* Laboratory assignments for afternoons.

6. *Calculation and Design of Direct Current Electrical Machinery*

Three hours. Second semester. Must be taken with 2. Not elective. *Tu.*, *Wed.*, *Th.*, *at 9.20.*

7. *Telegraph and Telephone Engineering*

Three hours. First semester. Elective for students who have credit for 2. *Mon.*, *Wed.*, *Th.*, *at 10.20.*

8. *Alternating Current Machinery*

Calculation and design of generators, motors, transformers, etc.

Three hours. Second semester. Must be taken with 10. Elective for students who have credit for 1, 2, and 3. *Mon.*, *Th.*, *Fri.*, *at 9.20.*

10. *Power and Lighting Stations*

Equipment and systems of distribution.

Three hours. Second semester. Must be taken with 8. Elective for students who have credit for 1, 2, and 3. *Mon.*, *Wed.*, *Th.*, *at 10.20.* Weekly trips of inspection.

12. *Electrical Engineering Problems*

Reading and discussion. Seminary method.

One hour. Second semester. Not elective. *Mon. at 11.20.*

‡ All the courses in Electrical Engineering are required of candidates for the degree of Bachelor of Science in Electrical Engineering. 1, 2 is required of candidates for the degree

13, 14. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Electrical Engineering. The thesis must embody a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XXII. ROMAN LITERATURE AND HISTORY

Albert Granger Harkness, A.M., Litt.D., *Professor of Roman Literature and History*

John Francis Greene, A.M., *Associate Professor of Roman Literature and History*

1. *Livy*

Designed to enable the student to acquire facility in reading Latin, and to instruct him in the use of the Latin texts as a means of gaining a knowledge of Roman history. Grammatical study and literary criticism also receive attention. *Professors* Harkness *and* Greene.

Three hours. First semester. Elective for students who presented elementary and advanced Latin for admission. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Tu., Th., Sat., at 12.20.*

2. *Cicero's Letters*

Aims and methods as in 1. *Professors* Harkness *and* Greene.

Three hours. Second semester. Elective for students who presented elementary and advanced Latin for admission. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Tu., Th., Sat., at 12.20.*

3. *Horace's Odes and Epodes, Tibullus, Propertius*

Critical study of the poems, supplemented by rapid reading with a view to comprehending the spirit of the author. The literary side of the study is made prominent. Lectures; literary topics assigned to the class for special study. *Professor* Greene.

Three hours. First semester. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

4. *Horace's Satires and Epistles, Juvenal*

Aims and methods as in 4. *Professor* Harkness.

Three hours. Second semester. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

of Bachelor of Science in Mechanical Engineering. 1 is required of candidates for the degree of Bachelor of Science in Civil Engineering.

5, 6. *Latin Poetry*

Aims to give a connected and comprehensive view of the history and development of Latin poetry. Lectures on the lives and writings of the authors; reading of characteristic selections; special study by members of the class of assigned topics in literary history and criticism. First semester, Plautus. Second semester, Lucretius and Catullus. Forms with 7, 8 a two-year consecutive course, affording a general survey of Roman literature. *Professors* HARKNESS *and* GREENE.

Three hours. Through the year. Elective for Juniors and Seniors. Either semester may be elected independently. *Tu., Wed., Sat., at 9.20.*

[7, 8. *Latin Prose*]

Aims to give a connected and comprehensive view of the history and development of Latin prose. Lectures on the lives and writings of the authors, on the development of oratory, etc.; reading of characteristic selections; special study, by members of the class, of assigned topics in literary history and criticism. First semester, specimens of early Latin, Cicero's *Brutus,* and Quintilian. Second semester, the *Annals* of Tacitus. Forms with 5, 6 a two-year consecutive course, affording a general survey of Roman literature.

Three hours. Through the year. Elective for Juniors and Seniors. Either semester may be elected independently. Not offered in 1913–14.

9, 10. *Petronius, Pliny the Younger, Martial*

Professor HARKNESS.

One hour. Through the year. Elective for Juniors, Seniors, and Graduates. *Fri. at 2.20.*

11, 12. *Latin Composition*

Professor GREENE.

One hour. Through the year. Elective for Sophomores, Juniors, and Seniors.

13, 14. *History of the Roman Empire*

The Early Empire. The Age of the Antonines. The Age of Constantine. *Professor* GREENE.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Either semester may be elected independently. *Tu., Wed., Sat., at 9.20.*

16. *Roman Civilization*

An outline of Roman civilization and its influence on modern times.

Special attention will be given to the literature and to the political and social life. No knowledge of Latin required. Must be preceded in the first semester by Greek 15, Greek Civilization. The two semesters together constitute the course in Classical Civilization. *Professors* HARKNESS *and* GREENE.

Three hours. Second semester. Required in the Freshman or Sophomore year of candidates for the degree of Bachelor of Philosophy. Not elective. *1st div., Mon., Th., Fri., at 9.20; 2d div., Mon., Tu., Th., at 11.20.*

17, 18. *Seminary in Latin*

Subject for 1913–14: Reading from the poetry of the Empire. Gudeman's *Latin Literature of the Empire,* vol. II. Questions in textual criticism and in the structure of Latin verse will be considered. *Professors* HARKNESS *and* GREENE.

Three hours. Two hours of attendance. Through the year. Elective for Graduates.

XXIII. ROMANCE LANGUAGES AND LITERATURES

COURTNEY LANGDON, A.B., *Professor of the Romance Languages and Literatures*

ALBERT BUSHNELL JOHNSON, A.M., *Associate Professor of the Romance Languages and Literatures*

CHARLES HERMAN HUNKINS, DR. *de l'Université de Paris, Assistant Professor of the Romance Languages and Literatures*

HENRI FELIX MICOLEAU, *Instructor in French*

BERNARD KEENAN, A.M., *Instructor in French*

1, 2. *Elementary Course, First Year*

Grammar, composition, dictation, conversation; translation of selections from modern authors into idiomatic English. *Messrs.* MICOLEAU *and* KEENAN.

Three hours. Through the year. Elective for students who did not present French for admission. *1st div., Tu., Th., Sat., at 8; 2d div., Mon., Tu., Th., at 2.20.*

3, 4. *Elementary Course, Second Year*

Reading of easy modern French prose in the form of stories, plays, or historical or biographical sketches; review of grammar; composition and conversation based upon the texts read. *Professor* HUNKINS.

Three hours. Through the year. Elective for students who have credit for 1, 2. *Wed., Fri., Sat., at 11.20.*

5, 6. *Intermediate Course*

Reading of modern and classical authors; review of grammar; composition and conversation based upon the texts read; dictation. *Professor* JOHNSON, *Messrs.* MICOLEAU *and* KEENAN.

Three hours. Through the year. Elective for students who have credit for 3, 4, or who presented elementary French for admission. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Tu., Th., Sat., at 8; 3d div., Mon., Th., Fri., at 9.20; 4th div., Tu., Th., Sat., at 8.*

7, 8. *Advanced Course*

An introduction to classical and modern French literature; composition; conversation based on the texts read; dictation. *Professors* JOHNSON *and* HUNKINS, *Mr.* MICOLEAU.

Three hours. Through the year. Elective for students who have credit for 5, 6, or who presented intermediate French for admission. *1st div., Mon., Tu., Th., at 11.20; 2d div., Mon., Tu., Th., at 11.20; 3d div., Tu., Wed., Sat., at 9.20; 4th div., Tu., Wed., Sat., at 9.20.*

9, 10. *The Realistic School*

Flaubert, Augier, the younger Dumas, the Goncourts, Daudet, Zola, Taine, Loti, and others; abstracts, in French, of works read outside the class; sight reading a prominent feature. *Professor* HUNKINS.

Three hours. Through the year. Elective for students who have credit for 7, 8. *Tu., Fri., Sat., at 10.20.*

11, 12. *The Romantic School*

The history of the romantic school; reading of authors from Chateaubriand and Victor Hugo to Rostand; abstracts on outside reading. Lectures in English and in French. *Professor* LANGDON.

Three hours. Through the year. Elective for students who have credit for 7, 8. *Mon., Wed., Th., at 10.20.*

[13, 14. *The Classical School*]

The history of the classical school; its formation, its apogee, and its decline. Lectures in French.

Three hours. Through the year. Elective for students who have credit for 9, 10, or 11, 12, and for approved students who have credit for 7, 8. Not offered in 1913–14.

15, 16. *Modern Spanish*

Grammar, conversation, composition, and reading of modern authors. *Professor* JOHNSON.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern language. *Tu., Fri., Sat., at 10.20.*

17, 18. *Modern Italian*

Grammar, composition, and reading of modern authors. *Professor* LANGDON.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern language. *Mon., Th., Fri., at 9.20.*

19, 20. *Dante in English*

A study of the whole of the *Divina Commedia* in English, in the light of modern thought and of other world-poems. *Professor* LANGDON.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Students are advised to elect this course in their Senior year. *Mon., Tu., Th., at 11.20.*

21, 22. *Spanish Language and Literature*

Selected works of classical and modern authors; composition; conversation. *Professor* JOHNSON.

Three hours. Through the year. Elective for students who have credit for 15, 16. *Mon., Th., Fri., at 9.20.*

[23, 24. *Practice in Writing and Speaking French*]

Intended especially for those preparing to teach. Written and oral translations from English into French. Recitations and dialogues in French; conversation; dictation; phonetics.

Three hours. Through the year. Elective for students who have credit for 7, 8. Not offered in 1913–14.

XXIV. SOCIAL AND POLITICAL SCIENCE‡

James Quayle Dealey, Ph.D., *Professor of Social and Political Science*

†Lester Frank Ward, A.M., LL.D., *Professor of Sociology*

John Corliss Dunning, LL.B., Ph.D., *Assistant Professor of Political Science*

SOCIAL SCIENCE

1. *Elementary Social and Political Science*

Affords a general outline of these subjects and serves as an introduction to the more extended and special courses which follow. *Professor* Dealey.

Three hours. In connection with Economics 1 constitutes a year course required in Sophomore, Junior, or Senior year of candidates for the degree of Bachelor of Arts and Bachelor of Philosophy, and in Sophomore year of candidates for the degree of Bachelor of Science. The combined courses will be given in two sections. For the first section Economics will be given in the first semester and Social and Political Science in the second semester. *Tu., Fri., Sat., at 10.20.* For the second section Social and Political Science will be given in the first semester and Economics in the second semester. *Mon., Wed., Fri., at 12.20.* Students must indicate their choice of sections on the registration card.

3, 4. *Social Problems and Conditions*

Modern social problems, such as charity, crime, intemperance, immigration. Constructive movements underlying urban social problems. *Professor* ——.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

5, 6. *Origin and Development of Society*

Development of social institutions and problems involved; formation and dispersion of primitive groups; origin of races; union and coalescence of groups; the race struggle; institutions growing out of the race struggle; stages of culture. In the second semester, special attention will be given to institutions growing out of domestic relations. *Professor* Dealey.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

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‡ The courses in this department other than 1 are open only to those students who have credit for Social and Political Science 1 and Economics 1.

† Died, April 18, 1913.

7, 8. *Sociology as a Science*

Its relations to other sciences; its psychologic basis; its fundamental principles and their applications to social problems. The utility of sociology as a means of increasing human achievement, the improvement of society through conscious effort. *Professor* DEALEY.

Three hours. Through the year. Elective for Seniors and Graduates. *Wed., Fri., Sat., at 11.20.*

11, 12. *Sociological Theories*

Conducted as a seminary. First semester, ancient and medieval theories in respect to social conditions and development; precursors of sociology. Second semester, sociological theories since the opening of the nineteenth century; a review of modern sociological thought in Europe and America and its influence on the life and institutions of society. *Professor* ——.

Three hours. Through the year. Elective for Seniors and Graduates. *Mon., Fri., 4.30 to 6.*

13, 14. *Investigation of Special Topics*

Intended to train the student in methods of gathering, handling, and presenting data in the study of social problems. For the year 1913–14 the subject will be: Social Legislation and Social Welfare. *Professor* ——.

Three hours. Five hours of investigation and one hour of classroom work. Through the year. Elective for Graduates, and for a limited number of approved Juniors and Seniors. *Mon., 4 to 5.*

POLITICAL SCIENCE

1. *Elementary Political and Social Science*

See Social Science 1.

3, 4. *Government and Politics of the United States*

First semester, national government, its organization, powers, and methods; current political issues. Second semester, state and municipal governments; framework and activities of European and American municipalities. *Professor* DUNNING.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Either semester may be elected independently. *Mon., Th., Fri., at 9.20.*

5. *Governments and Politics of Foreign States*

The political systems of typical leading states, including some of the states of Latin-America. Current international political situations and problems. *Professor* Dunning.

Three hours. First semester. Followed in the second semester by 6. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

6. *International Relations*

The development of the science of International Law. The general principles guiding the relations of states. Illustrative concrete cases. *Professor* Dunning.

Three hours. Second semester. Preceded in the first semester by 5. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

7. *Jurisprudence*

The development of law and of its fundamental principles. Special reference to Roman law and to the English common law. *Professor* Dunning.

Three hours. First semester. Followed in the second semester by 8. Elective for Seniors and Graduates. *Tu., Wed., Sat., at 9.20.*

8. *Constitutional Law*

Principles and development of American constitutional law. Case system. *Professor* Dunning.

Three hours. Second semester. Preceded in the first semester by 7. Elective for Seniors and Graduates. *Tu., Wed., Sat., at 9.20.*

[9, 10. *Political Theories*]

Classical and medieval political theories. Modern democratic theories in England, France, and the United States. Theory of the state; its origin, sovereignty, and government.

Three hours. Through the year. For Graduates. Not offered in 1913–14.

13, 14. *Investigation of Special Topics*

Intended to train students in methods of gathering and presenting data in the study of political problems. In connection with this course, work in comparative legislation may be taken under the direction of the Legislative Reference Bureau of the State Library. *Professor* Dunning.

Three hours. Five hours of investigation and one hour of classroom work.

Through the year. Elective for Graduates, and for a limited number of approved Seniors. *Th., 5 to 6.*

PHYSICAL TRAINING

FREDERICK WILLIAM MARVEL, PH.B., *Professor of Physical Training*

From Thanksgiving to the Spring Recess, all first and second year students are required to attend gymnasium exercises three times a week as follows:

FRESHMEN. *1st div., Tu., Fri., Sat., at 10.20 ; 2d div., Mon., Tu., Th., at 4.20.*

SOPHOMORES. *1st div., Mon., Wed., Th., at 10.20; 2d div., Tu., Th., Fri., at 3.20.*

A voluntary class for Juniors and Seniors will be held on *Mon., Tu., Th., Fri., at 5.10.* Classes in heavy gymnastics, under the direction of a special instructor, are held four afternoons a week. Classes in wrestling, under the direction of a special instructor, are held two afternoons a week. Instruction in swimming, under the direction of a special instructor, is given by appointment.

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JUNE 1914 NO. 3

OF THE
UNIVERSITY OF ILLINOIS
19 OCT 1914

BULLETIN
OF
BROWN UNIVERSITY

ANNOUNCEMENT OF COURSES
1914-1915

WOMEN'S COLLEGE EDITION

PROVIDENCE
PUBLISHED BY THE UNIVERSITY
[APRIL, MAY, JUNE, OCTOBER, DECEMBER]

as second-class matter April 1, 1905, at the Post Office at Providence, R. I., under Act of Congress of July 16, 1894

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GENERAL ANNOUNCEMENTS
FOR
THE ACADEMIC YEAR
1914–15

THE Academic Year begins with chapel service in Pembroke Hall, at 9 a.m., on Wednesday, September 23.

For information regarding Registration and Enrolment of Undergraduates and Graduates, and Requirements for the various Degrees, see pages 6–20 of this Announcement. The following special announcements relate to the Women's College. Undergraduates must register at the Registrar's Office, in Pembroke Hall, between 9 a.m. and 12 m., or between 2 p.m. and 4 p.m., on September 21 and 22. Undergraduates in residence must return their Registration cards to the Registrar not later than June 7. Graduate students register at the office of the Registrar of the University.

COURSES OF INSTRUCTION

WITH the exception of Biology 1, 2, Greek Literature and History 20, and Roman Literature and History 3, courses of instruction are identical with corresponding courses offered to men. Detailed information may be found on pages 21–98. The officers of instruction are those conducting courses for men also, with the addition of:

LIDA SHAW KING, A.M., LITT.D., LL.D., *Professor of Classical Literature and Archaeology*

FLORENCE HARRIS DANIELSON, A.M., *Instructor in Biology*

*Courses designated by a † are given at the University; women are admitted to them, but only on the recommendation of the Dean of the Women's College. Women may also be admitted to other University courses not announced here, with the special permission of the department and with the consent of the Dean of the Women's College. In courses designated by a * a final mark covering the work of the course as a whole is given at the end of the course, the marks given at the end of the first semester being regarded as temporary. Graduate courses are not included in this list, although ap-*

proved Seniors are admitted to many of them. For Graduate courses, see pages 21–98.

ART

1, 2. *History of Art from Antiquity through the Renaissance*

Professor POLAND.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. *Tu., Wed., Sat., at 9.25.*

[3, 4. *Modern Art, and Theory and Criticism of the Fine Arts*]

Not offered in 1914–15.

15,* 16.* *Freehand Drawing*

One hour. Two hours of drawing. Through the year. Elective for Undergraduates. Given at the Rhode Island School of Design. Hours to be arranged with the Director.

17,* 18.* *Advanced Drawing and Color Work*

Three hours. Six hours of drawing, or four hours of drawing and one hour lecture on Historic Ornament. Through the year. Elective for students who have credit for 15, 16, and who have taken or are taking 1, 2. Given at the Rhode Island School of Design. *Mon., Tu., Wed., at 2.* Lecture hour to be arranged by the Rhode Island School of Design.

ASTRONOMY

1, 2. *General Course*

Mr. CURRIER.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for Mathematics 2. *Wed., Fri., Sat., at 11.25.* Observations at Ladd Observatory.

[7, 8.† *Advanced Astronomy*]

Not offered in 1914–15.

BIBLICAL LITERATURE AND HISTORY

1, 2.† *Elementary Hebrew*

Dr. Stern.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

[11, 12.† *Gospels and Epistles*]

Not offered in 1914–15.

13, 14.† *Acts and Pauline Epistles*

Professor Fowler.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Either semester may be elected independently. *Wed., Fri., Sat., at 11.20.*

15, 16.† *Old Testament Literature and History*

Professor Fowler.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. *Mon., Wed., Th., at 10.20.*

[17, 18.† *New Testament Literature and History*]

Not offered in 1914–15.

19, 20. *The English Bible as Literature*

Professor Fowler.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. *Tu., Wed., Sat., at 9.25.*

21, 22.*† *Biblical Seminary*

Professor Fowler.

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors.

30.† *History of Religion*

Professors Fowler *and* Jones.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

BIOLOGY

1, 2. *General Biology*

The structure of animals and plants; elementary vital phenomena; the functions of organs; the development of organisms; classification. An outline of the more important biological theories, such as evolution, natural selection, variation, mutation and heredity, and the principles upon which modern hygiene and sanitation are based. The course will introduce the student to the use of the microscope, laboratory technic, and to scientific methods of observation and experiment. *Miss* DANIELSON.

Three hours. Six hours of attendance. Through the year. Required in Freshman or Sophomore year of candidates for the degree of Bachelor of Philosophy. Elective for Undergraduates. Lectures, *Wed.*, *Fri.*, *Sat.*, *at 11.25.*

3, 4. *Comparative Anatomy of Vertebrates*

Professor WALTER.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1, 2. *Tu.*, *Fri.*, *Sat.*, *at 10.25.*

5, 6.† *Anatomy of the Nervous System*

Professor MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2.

7, 8.† *Embryology and Histology*

Professor MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2. *Tu.*, *Th.*, *Sat.*, *at 8.*

9, 10.† *Advanced Histology and Pathology*

Professor MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 1, 2, and 7, 8.

11, 12.† *General Physiology*

Professor MITCHELL.

Three hours. Six hours of attendance. Through the year. Must be preceded by 1, 2, and by Chemistry 1, 2. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon.*, *Tu.*, *Th.*, *at 3.20.*

13, 14.† *Chemical Physiology*

Professor Mitchell.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for or are taking Chemistry 7, 8. *Tu., Fri., Sat., at 10.20.*

16.† *Bacteriology*

Professor Gorham.

Three hours. Six hours of attendance. Second semester. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon., Wed., Th., at 10.20.*

17, 18.† *Advanced Bacteriology*

Professor Gorham.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 16.

[20. *Ornithology*]

Not offered in 1914–1915.

24.† *Physiology*

Professor Mitchell.

Three hours. Second semester. Elective for Juniors and Seniors. *Mon., Wed., Th., at 10.20.*

BOTANY

[1, 2. *General Course*]

Not offered in 1914–15.

3, 4.† *Physiological Anatomy*

Professor York.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2, or its equivalent.

5, 6.† *Comparative Morphology and Phylogeny*

Professor York.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2, or its equivalent.

7, 8.† *Special Course*

Professor York.

One or more hours. Through the year. Either semester may be elected independently. Elective for Graduates, and for approved Juniors and Seniors.

10. *Trees*

Professor York.

One hour. Two hours of attendance. Second semester. Elective for Undergraduates. Hours to be arranged.

[11, 12.† *Physiology*]

Not offered in 1914–15.

CHEMISTRY

1, 2. *Descriptive Chemistry*

Professor Bigelow *and Mr.* Foote.

Three hours. Through the year. Elective for Undergraduates. *Tu., Th., Sat., at 12.25.* Laboratory hours to be arranged with the instructor.

3, 4.† *Qualitative and Quantitative Analysis*

Professor Bigelow *and Mr.* Arnold.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2. *1st div., Fri. at 11.20; 2d div., Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

5, 6.† *Quantitative Analysis, Advanced Course*

Professor Bigelow.

Six hours. Twelve hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3, 4. Laboratory hours to be arranged with the instructor.

7, 8.† *Organic Chemistry*

Professor Bucher *and Dr.* Holt.

Six hours. Through the year. Elective for approved Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

10.† *Assaying*

Professor Bucher *and Dr.* Holt.

Six hours. Twelve hours of attendance. Second semester. Elective for Seniors and Graduates who have credit for 1-6.

12.† *Organic Dyes*

Dr. Holt.

Three hours. Six hours of attendance. Second semester. Elective for approved Seniors and Graduates.

[15, 16.† *Physical Chemistry*]

Not offered in 1914–15.

[20.† *Inorganic Chemistry, Advanced Course*]

Not offered in 1914–15.

21, 22.† *Organic Preparations, Advanced Course*

Professor Bucher *and Dr.* Holt.

Three or more hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

23, 24.† *Inorganic Preparations, Advanced Course*

Professor Bucher *and Dr.* Holt.

Three or more hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 7, 8.

27, 28.† *Conference on Special Topics in Chemistry*

Professor Bucher.

One hour. Through the year. Elective for approved students.

29, 30.† *Industrial Chemistry and Research*

Professor Bucher.

Three or more hours. Through the year. Elective for approved Graduates.

ECONOMICS

1. *Elementary Economics*

Professor Motley.

Three hours. In connection with Social Science 1 constitutes a year course required in Sophomore, Junior, or Senior year of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy. First semester. *Tu., Th., Sat., at 12.25.*

5, 6.† *Money and Banking*

Professor Gardner.

Three hours. Through the year. *Wed., Fri., Sat., at 11.20.*

8. *Socialism and Allied Movements*

Professor Motley.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.25.*

[10.† *Tariff, Reciprocity, and Shipping Subsidies*]

Not offered in 1914–15.

11, 12.† *Public Finance and Financial History*

Professor Gardner.

Three hours. Through the year. *Tu., Th., Sat., at 12.20.*

13.† *Statistics*

Three hours. Two hours of attendance. First semester. *Fri., 3.30 to 5.20.*

14.† *Accounting*

Three hours. Two hours of attendance. Second semester. *Fri., 3.20 to 5.20.*

15.† *Trade and Transportation*

Professor Motley.

Three hours. First semester. *Mon., Wed., Th., at 10.20.*

16.† *Corporations and Corporation Finance*

Professor Motley.

Three hours. Second semester. *Mon., Wed., Th., at 10.20.*

21, 22.† *Investigation of Special Topics*

Professors Gardner *and* Motley.

Three hours. Six hours of attendance. Through the year. Either semester may be elected independently. Students intending to take either of these courses must secure the permission of the head of the department not later than December 1 or June 1 in the semester preceding that in which they desire to take the course. It is expected that as a rule these courses will be taken in connection with lecture courses. Hours to be arranged with the instructor.

23, 24.† *Economic Seminary*

Professors Gardner *and* Motley.

Three hours. Two hours of attendance. Through the year. Elective for Seniors and Graduates who have taken advanced work in Economics. Hours to be arranged with the instructor.

EDUCATION

2. *Principles of Education*

Professor Jacobs.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.25.*

1. *History of Education*

Professor Jacobs.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.25.*

3. *Psychology of Education*

Professor Colvin.

Three hours. First semester. Elective for students who have credit for 1 or 2, or who are taking 2, and for Graduates. *Mon., Th., Fri., at 9.25.*

4. *Practical Introduction to Teaching*

Professor Colvin.

Three hours. Second semester. Elective for students who have credit for or are taking other courses in Education, and for Graduates. *Mon., Th., Fri., at 9.25.*

ENGLISH

1. *Rhetoric and Composition*

Professor Hastings, *Messrs.* Williams *and* ———.

Three hours. First semester. Required of all Freshmen. *1st div., Mon., Th., Fri., at 9.25; 2d div., Tu., Wed., Sat., at 9.25.*

2. *Rhetoric and Composition*

Professor Hastings, *Messrs.* Williams *and* ———.

Three hours. Second semester. Required in the Sophomore year of all candidates for the degree of Bachelor of Arts or Bachelor of Philosophy. *1st div., Mon., Th., Fri., at 9.25; 2d div., Mon., Tu., Th., at 3.25.*

48. *English Literature from the Beginning to 1700*

Professor Benedict.

Three hours. Second semester. Required in the Freshman year of all candidates for the degree of Bachelor of Arts or Bachelor of Philosophy. *Mon., Th., Fri., at 9.25.*

49. *English Literature from 1700 to 1900*

Professor BENEDICT.

Three hours. First semester. Required in the Sophomore year of all candidates for the degree of Bachelor of Arts or Bachelor of Philosophy. *Mon., Th., Fri., at 9.25.*

[5, 6. *English Composition, Advanced Course*]

Not offered in 1914–15.

7, 8. *Argumentative Composition*

Professor HASTINGS.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Required in the Sophomore or Junior year of candidates for the degree of Bachelor of Philosophy who did not elect to take Mathematics in their Freshman year. *Wed., Fri., Sat., at 11.25.*

11, 12. *Public Speaking*

Professor CROSBY.

Three hours. Through the year. Elective for Juniors and Seniors. *Tu., Fri., Sat., at 10.25.*

15, 16.† *Old English*

Professor POTTER.

Three hours. Through the year. Elective for Seniors. *Tu., Th., Fri., at 4.20.*

[17, 18. *Chaucer*]

Not offered in 1914–15.

[23, 24. *The Modern English Drama*]

Not offered in 1914–15.

[25, 26. *Shakspere*]

Not offered in 1914–15.

27, 28. *Shakspere*

Professor POTTER.

Three hours. Through the year. Elective for students who have credit for a year's work in English Literature. *Tu., Wed., Sat., at 9.25.*

29. *English Literature, exclusive of the Drama, from 1558 to 1603*

Professor BRONSON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. First semester. Elective for students who have credit for a year's work in English Literature. *Tu., Th., Sat., at 12.25.*

30. *English Literature, exclusive of the Drama, from 1603 to 1660*

Professor Bronson.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Second semester. Elective for students who have credit for a year's work in English Literature. *Tu., Th., Sat., at 12.25.*

[31, 32. *English Literature from 1660 to 1798*]

Not offered in 1914–15.

33, 34. *The English Novel*

Professor Damon.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for a year's work in English Literature. *Wed., Fri., Sat., at 11.25.*

[35. *English Literature from 1798 to 1832, Poetry*]

Not offered in 1914–15.

[36. *English Literature from 1798 to 1832, Prose*]

Not offered in 1914–15.

[37. *English Literature from 1832 to 1892, Prose*]

Not offered in 1914–15.

[38. *English Literature from 1832 to 1892, Poetry*]

Not offered in 1914–15.

[39, 40. *American Literature*]

Not offered in 1914–15.

[42. *Contemporary English and American Literature*]

Not offered in 1914–15.

43, 44.† *Seminary in English Literature*

Professor Benedict.

Three hours. Two hours of attendance. Through the year. Elective for a limited number of Seniors who have attained at least the grade of C in two years' work in English Literature.

GEOLOGY

1. *General Geology*

Professor Brown.

Three hours. First semester. Elective for Undergraduates. *Wed., Fri., Sat., at 11.25.*

6. *Economic Geography and Conservation*

Professor Brown.

Three hours. Second semester. Elective for Undergraduates who have credit for 1 or 3, or who presented Physiography for admission, except Freshmen and Sophomores who are taking another course in the department. *Wed., Fri., Sat., at 11.25.*

[9, 10.† *Mineralogy and Petrography*]

Not offered in 1914–15.

11, 12.† *Research in Geology and Geography*

One to six hours. Through the year. Elective for Graduates and approved Undergraduates. Either semester may be elected independently.

GERMANIC LANGUAGES AND LITERATURES

1, 2. *Elementary Course, First Year*

Mr. Mitchell.

Three hours. Through the year. Elective for students who did not present German for admission. *Mon., Wed., Fri., at 12.25.*

3, 4. *Elementary Course, Second Year*

Mr. Mitchell.

Three hours. Through the year. Elective for students who have credit for 1, 2, or who presented elementary German (1 year) for admission. *Mon., Tu., Th., at 11.25.*

5, 6. *Intermediate Course*

Mr. Keenan.

Three hours. Through the year. Elective for students who have credit for 3, 4, or who presented elementary German (2 years) for admission. *Mon., Wed., Fri., at 12.25.*

7, 8. *Advanced Course in Standard Authors, Classical and Modern*

Dr. Rand.

Three hours. Through the year. Elective for students who have credit for 3, 4, with rank of B; or 5, 6; or who presented intermediate German for admission. *Mon., Wed., Fri., at 12.25.*

9, 10.† *Modern Prose*

Professor von Klenze *and Mr.* Mitchell.

Three hours. Through the year. Elective for students who have credit for 5, 6; or who have passed 3, 4, with grade B; or who presented intermediate German for admission. *Tu., Fri., Sat., at 10.20.*

[11, 12. *German Lyrical Poetry*]

Not offered in 1914–15.

15, 16. *The German Drama of the Nineteenth Century*

Professor von Klenze.

Three hours. Through the year. Elective for students who have credit for 3, 4; or 7, 8; or 9, 10. *Mon., Wed., Fri., at 12.25.*

[17, 18.† *Lessing and Schiller*]

Not offered in 1914–15.

23. 24.† *Goethe: A Study of His Life and Works*

Professor von Klenze.

Three hours. Through the year. Elective for students who have credit for 7, 8; or 9, 10. *Tu., Th., Sat., at 12.20.*

[25, 26.† *Outline History of German Literature*]

Not offered in 1914–15.

[27, 28.† *German Literature in the Nineteenth Century*]

Not offered in 1914–15.

31.† *Gothic*

Dr. Rand.

Three hours. First semester. Elective for Graduates and approved Undergraduates.

32.† *Old High German*

Dr. Rand.

Three hours. Second semester. Elective for Graduates and approved Undergraduates.

[33.† *Old Norse*]
Not offered in 1914–15.

[34.† *Germanic Mythology*]
Not offered in 1914–15.

[35, 36.† *Middle High German*]
Not offered in 1914–15.

GREEK LITERATURE AND HISTORY

A, B. *Elementary Course*
Professor MANATT *and* ———.

Three hours. Through the year. Elective for students who did not present elementary and advanced Greek for admission. *Mon., Wed., Fri., at 12.25.*

1. *Homer and the Greek Anthology*
Professor MANATT.

Three hours. First semester. Elective for students who presented elementary and advanced Greek for admission, or who have credit for A, B, and have done the additional work necessary to complete the requirement. *Mon., Tu., Th., at 11.25.*

2. *Plato, Lysias, and Aristophanes*
Professor ALLINSON.

Three hours. Second semester. Elective for students who have credit for 1. *Mon., Tu., Th., at 11.25.*

3. *Lucian and Sophocles*
Professor ALLINSON.

Three hours. First semester. Elective for students who have credit for 2 or its equivalent. *Wed., Fri., Sat., at 11.25.*

4. *The Historians*
Professor MANATT.

Three hours. Second semester. Elective for Sophomores. *Wed., Fri., Sat., at 11.25.*

[5. *Epic Poetry*]
Not offered in 1914–15.

[6. *The Drama*]

Not offered in 1914–15.

7. *Lyric and Pastoral Poetry*

Professor MANATT.

Three hours. First semester. Elective for Juniors and Seniors. *Mon.*, *Wed.*, *Fri.*, *at 12.25.*

8. *Plato, Aeschylus, and Aristotle*

Professor ALLINSON.

Three hours. Second semester. Elective for Juniors and Seniors. *Mon.*, *Wed.*, *Fri.*, *at 12.25.*

[9. *The Attic Orators*]

Not offered in 1914–15.

[10. *Lucian and Pausanias*]

Not offered in 1914–15.

[12. *Greek Composition*]

Not offered in 1914–15.

15. *Greek Civilization*

Professor ALLINSON.

Three hours. Second semester. Required in the Freshman or Sophomore year of all candidates for the degree of Bachelor of Philosophy. Elective for others. Must be preceded in the first semester by Latin 16. *Tu.*, *Wed.*, *Sat.*, *at 9.25.*

17, 18.† *Seminary in Greek*

For alternative course in Comparative Philology, see Indo-European Philology 4.

Three hours. Two hours of attendance. Through the year. Elective for Graduates and approved Seniors.

20. *Introduction to Greek Archaeology*

Outline of the remains of the earliest Greek civilization; an introductory study of Greek vases, coins, small bronzes, and terra-cotta figurines. Intended to give a general survey of these sources for Greek history and life. Illustrated lectures; collateral reading. *Professor* KING.

Three hours. Second semester. Elective for students who have completed one course in Latin or Greek. *Mon.*, *Th.*, *Fri.*, *at 9.25.*

HISTORY

1, 2. *Medieval and Modern History of Europe*

Professor MacDonald.

Three hours. Through the year. Required of candidates for the degree of Bachelor of Arts in the Sophomore or Junior year, and of candidates for the degree of Bachelor of Philosophy in the Freshman, Sophomore, or Junior year. *Mon., Tu., Th., at 11.25.*

3.† *History of Christianity: Early and Medieval Period*

Professor Collier.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. With 4 constitutes a continuous year course in Church history, but each course may be elected independently. *Tu., Th., Sat., at 12.20.*

4.† *History of Christianity: From the Reformation to the present*

Professor Collier.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

[5. *The French Revolution and the Napoleonic Era*]

Not offered in 1914–15.

[6. *Europe since 1815*]

Not offered in 1914–15.

7. *English History to 1603*

Professor Collier.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates, and for Sophomores who have credit for 1, 2. *Mon., Tu., Th., at 11.25.*

8. *English History, 1603 to the present*

Professor Collier.

Three hours. Second semester. Elective for Sophomores, Juniors, Seniors, and Graduates who have credit for 7, and for others by special permission. *Mon., Tu., Th., at 11.25.*

11, 12.† *Seminary in European History*

Professor Collier.

Three hours. Two hours of attendance. Through the year. Elective for Graduates and approved Seniors.

13, 14. *American History*

Professor MacDonald.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Either semester may be elected independently, but 14 should preferably be preceded by 13. *Tu., Fri., Sat., at 10.25.*

15, 16.† *Constitutional and Political History of the United States*

Professor MacDonald.

Three hours. Two hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., at 12.20.*

17, 18.† *Seminary in American History*

Professor MacDonald.

Three hours. One to two hours of attendance. Through the year. Elective for Graduates and approved Seniors. The course should be preceded by 13, 14, or 15, 16, or 19, 20, but in exceptional cases may be taken by students who at the same time are taking one of these groups of courses.

[19.† *Social History of America to 1787*]

Not offered in 1914–15.

[20.† *History of the United States since 1860*]

Not offered in 1914–15.

INDO-EUROPEAN PHILOLOGY

4.† *Comparative Philology* (*Seminary Course*)

Professor Allinson.

Three hours. Two hours of attendance. First semester. Elective for Graduates and approved Seniors.

See Greek 17, 18.

MATHEMATICS

INTRODUCTORY STATEMENT‡

For students who presented only Algebra and Plane Geometry for admis-

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‡ Students wishing to specialize in Mathematics should take the undergraduate courses in the order 2, 3, 5, 6, 7, 8, 9. Course 1, together with as many of courses 21-44 as possible, should be taken as opportunity offers in connection with the other courses.

It is recommended that students who contemplate teaching in the secondary schools elect courses 1-8, 41, 42, 43, 44.

Courses 21-40 are designed primarily for Graduates. Two or three of these courses are offered each year according to the needs of students. For those who have taken all of them, other courses can usually be arranged.

sion. Candidates for the degree of Bachelor of Arts, and candidates for the degree of Bachelor of Philosophy who do not intend to take Argumentation in the Sophomore year, are required to take one of the following combinations of courses: (A) 2, 1; (B) 2, 3. Students who intend to specialize in Mathematics are advised to take both 1 and 3 the second semester; but if only three hours can be taken in the Freshman year, it is advisable to elect 3 the second semester.

Students who presented subjects other than Algebra and Plane Geometry are referred to pages 70, 71.

2. *Plane Trigonometry*

Professors MANNING *and* ARCHIBALD.

Three hours. First semester. Required as noted in Introductory Statement. Elective for other Undergraduates who did not present Plane Trigonometry for admission. *Tu., Fri., Sat., at 10.25.*

1. *Solid and Spherical Geometry*

Professors RICHARDSON *and* ———.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for other Undergraduates who did not present Solid Geometry for admission. *Tu., Fri., Sat., at 10.25.*

3. *Algebra*

Professor MANNING.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for other Undergraduates. *Mon., Wed., Fri., at 12.25.*

[4. *Algebra*]

Not offered in 1914–15.

5. *Plane Analytic Geometry*

Professor RICHARDSON.

Three hours. First semester. Required as noted in Introductory Statement. Elective for students who have credit for Plane Trigonometry. *Mon., Wed., Th., at 10.25.*

6. *Analytic Geometry and Differential Calculus*

Professor ARCHIBALD.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for students who have credit for 5. *Mon., Wed., Th., at 10.25.*

7, 8.† *Differential and Integral Calculus*

Professor ARCHIBALD.

Three hours. Through the year. Elective for students who have credit for 6. *Tu., Th., Sat., at 12.20.*

9.† *Differential Equations*

Professor MANNING.

Two hours. First semester. Elective for students who have credit for 8 or 20. *Tu., Th., at 12.20.*

[12.† *Modern Analytic Geometry*]

Not offered in 1914–15.

[21, 22.† *Function Theory of a Complex Variable*]

Not offered in 1914–15.

23, 24.† *Differential Equations, Advanced Course*

Professor MANNING.

Three hours. Through the year. Elective for those who have credit for 21, 22.

25, 26.† *Advanced Algebra*

Professor RICHARDSON.

Three hours. Through the year. Elective by special permission of the instructor. *Mon., Wed., Fri., at 8.*

27, 28.† *Projective Geometry*

Professor ARCHIBALD.

Three hours. Through the year. Elective for Graduates and approved Undergraduates.

[29, 30.† *Function Theory of a Real Variable*]

Not offered in 1914–15.

[31, 32. † *Applications of Calculus to Geometry*]

Not offered in 1914–15.

[41, 42.† *Fundamental Problems of Algebra*]

Not offered in 1914–15.

43, 44. *Foundations, Methods, and Problems of Geometry*

Professor ARCHIBALD.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *~~Tu.~~, ~~Th.~~, ~~Sat.~~, at 12.25.*
Mon., Wed., Fri.,

MUSIC

1, 2. *The Appreciation of Music*

Mr. Wilde.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Mon., *Tu.,* ~~*Th.*~~, *at 11.25*, and a third hour at the pleasure of the instructor.

PHILOSOPHY

1, 2. *Logic*

Professor Jones.

Three hours. Through the year. Elective for Sophomores and Juniors. *Tu., Th., Sat., at 12.25.*

3. *Psychology*

A survey of the main facts and laws of mental life, aiming to provide a sound foundation for further acquaintance with this and allied subjects, for an improved judgment in dealing with many practical problems, and for understanding the psychological bases of philosophy.

Professor Delabarre.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors, *Tu., Fri., Sat., at 10.25.*

4. *Ethics*

Professor Everett.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. Mon., ~~*Tu.*~~, *Wed., Th., at 10.25.*

5, 6. † *Psychology, Intermediate Course*

Professor Delabarre.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for a course in Psychology.

[7, 8. *History of Philosophy*]

Not offered in 1914–15.

9. *Philosophy of Religion*

Professor Everett.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. Mon., ~~*Tu.*~~, *Wed., Th., at 10.25.*

10.† *Applications of Psychology*

Professor Delabarre.

Three hours. Second semester. Elective for students who have credit for 3. *Tu., Wed., Sat., at 9.20.*

11, 12.† *Experimental Psychology, Introductory Laboratory Course*

Professor Delabarre.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3.

13, 14.† *Current Tendencies in Philosophy*

Professor Jones.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

17, 18.† *Psychology, Advanced Course*

Professor Delabarre.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 5, 6.

19, 20.† *Experimental Psychology, Advanced Laboratory Course*

Professor Delabarre.

One to six hours. Two to twelve hours of attendance. Through the year. Elective for students who have credit for 11, 12. May be taken for more than six hours by Graduates.

[21, 22.† *Advanced Ethics*]

Not offered in 1914–15.

23, 24.† *Philosophical Seminary*

Professor Everett.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for a year course in Philosophy.

PHYSICS

1, 2. *Elementary Physics*

Professor Barus.

Three hours. Through the year. Elective for Undergraduates who have credit for entrance Algebra and Plane Geometry. *Mon., Tu., Th., at 11.25.*

3, 4.† *Elementary Physics, continued*

Professor Barus.

Three hours. Through the year. Elective for students who have credit for 1, 2, and Mathematics 1, 2. *Tu., Fri., Sat., at 10.20.*

5, 6.† *Experimental Physics*

Professor Palmer.

Three hours. Six hours of attendance. Through the year. Elective for Students who have credit for 1, 2.

7, 8.† *Mathematical Treatment of Dynamical Problems*

Professor Palmer.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 5, 6, and Mathematics 9, 10.

9, 10.† *Mathematical Theory of Electricity and Magnetism*

Professor Palmer.

Three hours. Through the year. Elective for Graduates and Seniors who have credit for 5, 6, and Mathematics 9, 10.

11, 12.† *Advanced Laboratory Course*

Professors Barus, Palmer, *and* Watson.

Three or six hours. Six or twelve hours of attendance. Through the year. Elective for students who have credit for 5, 6.

15, 16.† *Physics, Advanced Course*

Professor Barus.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for Mathematics 7, 8.

23, 24.† *Precision Measurements in Photometry, Electricity, and Magnetism*

Professor Palmer.

Four hours. Eight hours of attendance. Through the year. Elective for students who have credit for 5, 6, or 21, 22, and Mathematics 7, 8, or 19, 20.

25, 26.† *Radiation, Optics, and Heat*

Professor Palmer.

Three or six hours. Six or twelve hours in the laboratory. Through the year. Elective for students who have credit for 5, 6, or 21, 22.

ROMAN LITERATURE AND HISTORY

1. *Livy*

Professors Harkness *and* Greene.

Three hours. First semester. Elective for students who presented elementary and advanced Latin for admission. *Mon., Tu., Th., at 2.25.*

2. *Cicero's Letters*

Professor Greene.

Three hours. Second semester. Elective for students who presented elementary and advanced Latin for admission. *Mon., Tu., Th., at 2.25.*

3. *Catullus and Virgil*

Professor King.

Three hours. First semester. Elective for Sophomores. *Tu., Fri., Sat., at 10.25.*

4. *Horace's Satires and Epistles, Juvenal*

Professor Harkness.

Three hours. Second semester. Elective for Sophomores. *Tu., Fri., Sat., at 10.25.*

[5, 6. *Latin Poetry*]

Not offered in 1914–15.

7, 8. *Latin Prose*

Professors Harkness *and* Greene.

Three hours. Through the year. Elective for Juniors and Seniors. Either semester may be elected independently. *Tu., Th., Sat., at 12.25.*

11, 12. *Latin Composition*

Professor Greene.

One hour. Through the year. Elective for Sophomores, Juniors, and Seniors. Hour to be arranged.

16. *Roman Civilization*

Professor Greene.

Three hours. First semester. Required in the Freshman or Sophomore year of candidates for the degree of Bachelor of Philosophy. Elective for others. Must be followed in the second semester by Greek 15. *Mon., Tu., Th., at 11.25.*

ROMANCE LANGUAGES AND LITERATURES

1, 2. *Elementary Course, First Year*

Mr. Micoleau.

Three hours. Through the year. Elective for students who did not present French for admission. *Mon., Wed., Th., at 10.25.*

5, 6. *Intermediate Course*

Professor Hunkins.

Three hours. Through the year. Elective for students who presented elementary French (2 years) for admission. *Mon., Wed., Th., at 10.25.*

7, 8. *Advanced Course*

Professor Johnson.

Three hours. Through the year. Elective for students who have credit for 5, 6, or who presented intermediate French for admission. *Tu., Wed., Sat., at 9.25.*

[9, 10.† *The Realistic School*]

Not offered in 1914–15.

11, 12. *The Romantic School*

Professor Langdon.

Three hours. Through the year. Elective for students who have credit for 7, 8. *Tu., Wed., Sat., at 9.25.*

13, 14.† *The Classical School*

Mr. Micoleau.

Three hours. Through the year. Elective for students who have credit for 9, 10, or 11, 12, and for approved students who have credit for 7, 8. *Mon., Tu., Th., at 11.20.*

15, 16.† *Modern Spanish*

Professor Johnson.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern language. *Tu., Fri., Sat., at 10.20.*

17, 18. *Modern Italian*

Professor Langdon.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern language. *Wed., Fri., Sat., at 11.25.*

[19, 20. *Dante in English*]
Not offered in 1914–15.

[21, 22.† *Spanish Language and Literature*]
Not offered in 1914–15.

23, 24. *Practice in Writing and Speaking French*
Professor Johnson.

Three hours. Through the year. Elective for students who have credit for 7, 8. *Mon., Wed., Th., at 10.25.*

SOCIAL AND POLITICAL SCIENCE

SOCIAL SCIENCE

1. *Elementary Social Science*
Professor Dealey.

Three hours. In connection with Economics 1 constitutes a year course required in Sophomore, Junior, or Senior year of candidates for the degree of Bachelor of Arts and Bachelor of Philosophy. Second semester. *Tu., Th., Sat., at 12.25.*

3, 4. *Social Problems and Conditions*
Professor Bristol.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.25.*

7.† *Sociology as a Science*
Professor Dealey.

Three hours. First semester. Followed in the second semester by 8. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

8.† *Sociology in its Applications*
Professor Dealey.

Three hours. Second semester. Preceded in the first semester by 7. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

11, 12.† *Seminary in Sociology*
Professor Dealey.

Three hours. Through the year. Elective for approved Seniors and Graduates. *Mon., Th., 4.30 to 6.* Not to be offered in 1915–16.

13. 14.† *Training Course for Social Service*

Professor Bristol.

Three hours. Five hours of field work and one hour of class-room discussion. This course must be preceded or accompanied by 3, 4. Through the year. Elective for Graduates, and for a limited number of approved Juniors and Seniors. *Fri., 5 to 6.*

POLITICAL SCIENCE

[1. *Elementary Political Science*]

Not offered in 1914–15.

3. *Government and Politics of the United States*

Dr. Dunning.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.25.*

HYGIENE AND PHYSICAL EDUCATION

M. Elizabeth Bates, *Instructor*

From Thanksgiving until the Spring recess, first and second year students are required to attend classes in the gymnasium three times a week. Seniors and Juniors may elect one, two, or three hours. In the fall and spring all students may take athletics. Students are carefully examined before exercise is assigned.

Freshman Class. Gymnastics, games, dancing, and conferences in practical hygiene. Three hours. *Mon., Tu., Th., 3.30 to 4.15.*

Sophomore Class. Gymnastics, games, dancing, and conferences in practical hygiene. More advanced than Freshman work. Three hours. *Mon., Tu., Th., 2.30 to 3.15.*

Senior and Junior Elective Class. Similar to the required work, but more advanced. One or two hours. *Tu., 4.30 to 5.15; Fri., 2.30 to 3.15.*

Play Course. Play, games, and folk dances suitable for elementary schools, playgrounds, and social settlements. Elective. One hour. *Fri., 3.30 to 4.15.*

Restricted Exercise. Restricted gymnastics, games, and dancing will be offered to students who, because of their organic condition, or of temporary disability, are unable to take the regular class work.

Rest and Hygiene Reading. Students who are not able to take the required exercise in the gymnasium will be assigned to the rest room as a substitute.

They will also do prescribed reading in personal hygiene and have conferences in hygiene with the instructor.

Remedial Exercise. Special remedial work will be given to students who have round shoulders, lateral curvature of a functional nature, or flat foot.

Athletics. All students are offered basket ball, tennis, and bowling under the supervision of the instructor during the entire year.

ANNOUNCEMENT OF COURSES
OFFERED IN
BROWN UNIVERSITY
1914–1915

PROVIDENCE, RHODE ISLAND
PUBLISHED BY THE UNIVERSITY
1914

CALENDAR 1914–1915

Vacations and Holidays occurring within the Academic Year 1914–15 are indicated by dark type.

1914

JULY

S	M	T	W	T	F	S
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AUG.

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SEPT.

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OCT.

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DEC.

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1915

JAN.

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MAR.

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JUNE

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1915

JULY

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AUG.

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NOV.

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DEC.

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THE UNIVERSITY CALENDAR 1914–15

1914

SEPTEMBER 2.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
SEPTEMBER 15–21.	*Tuesday to Monday inclusive.* Examinations for admission to the Freshman class and to advanced standing.
SEPTEMBER 21, 22.	*Monday and Tuesday.* Registration of new students and enrolment of students previously in residence.
SEPTEMBER 23.	*Wednesday,* 9 a.m. ACADEMIC YEAR BEGINS (fourth Wednesday in September). Registration of Graduate students.
OCTOBER 7.	*Wednesday.* Examination in Greek for the President's Premiums, 5 Maxcy Hall, 2.30 p.m.
OCTOBER 14.	*Wednesday.* Examination in Latin for the President's Premiums, 1 Sayles Hall, 2.30 p.m.
OCTOBER 21.	*Wednesday.* Examination in Mathematics for the Hartshorn Premiums, 27 Wilson Hall, 2 p.m.
OCTOBER 28.	*Wednesday.* Examination in French for the Hicks Premiums, 1 Sayles Hall, 2.30 p.m.
NOVEMBER 4.	*Wednesday.* Examination in German for the Caesar Misch Premiums, 5 Sayles Hall, 2.30 p.m.
NOVEMBER 26.	*Thursday.* Thanksgiving Day. No University exercises.
DECEMBER 2.	*Wednesday.* Preliminary discussion for the Class of 1880 Prizes.
DECEMBER 4.	*Friday.* Last day for receiving essays submitted in competition for the Class of 1880 Prizes.
DECEMBER 9.	*Wednesday.* Public discussion for the Class of 1880 Prizes.
DECEMBER 23.	*Wednesday,* 12.20 p.m. CHRISTMAS RECESS BEGINS.

1915	
January 4.	*Monday.* Christmas Recess ends.
January 5.	*Tuesday,* 8 a.m. Recitations begin.
Jan. 25 *to* Feb. 5.	*Monday to Friday inclusive.* Semester examinations.
February 1.	*Monday.* Last day for applications of competitors for the Carpenter Prizes in Elocution.
February 6–9.	*Saturday to Tuesday inclusive.* Mid-year Recess.
February 8, 9.	*Monday and Tuesday.* Enrolment of Undergraduate students.
February 10.	*Wednesday,* 8 a.m. Second Semester begins. Enrolment of Graduate students.
February 22.	*Monday.* Washington's Birthday. No University exercises.
March 1.	*Monday.* Last day for applications of competitors for the Bishop McVickar Prizes.
March 24.	*Wednesday.* Last day for receiving essays submitted in competition for the Gaston Prize Medal.
April 1.	*Thursday.* Last day for receiving applications for examination for the degree of Doctor of Philosophy, or of Master of Arts *in absentia.*
April 1–7.	*Thursday to Wednesday inclusive.* Spring Recess.
April 8.	*Thursday,* 8 a.m. Recitations begin.
April 15.	*Thursday.* Last day for receiving applications for the Grand Army of the Republic Fellowship.
April 27.	*Tuesday.* Carpenter Prize Speaking Competition.
April 30.	*Friday.* Last day for receiving theses of candidates for the degree of Doctor of Philosophy.
May 1.	*Saturday.* Last day for receiving essays submitted in competition for the Bishop McVickar Prizes.
May 11.	*Tuesday.* Gaston Prize Medal Competition.
May 18.	*Tuesday.* Hicks Prize Debate.

May 29.	*Saturday.* Last day for examinations for advanced degrees.
May 29 *to* June 11.	*Saturday to Friday inclusive.* Semester examinations.
May 31.	*Monday.* Observed as Memorial Day. No University exercises.
June 13.	*Sunday.* Baccalaureate Sermon, First Baptist Meeting House, 4.30 p.m.
June 14.	*Monday.* Class Day.
June 15.	*Tuesday.* Annual Meeting of the Phi Beta Kappa Society, Administration Building, 9.30 a.m. Ivy Day, Pembroke Hall. Annual Meeting of the Associated Alumni, Lyman Gymnasium, 6.30 p.m.
June 16.	*Wednesday.* One Hundred and Forty-Seventh Annual Commencement (third Wednesday in June), First Baptist Meeting House, 10 a.m.
June 17.	*Thursday.* Meeting of the Corporation.
June 17 *to* Sept. 21.	Summer Vacation.
September 1.	*Wednesday.* Annual Meeting of the Corporation (first Wednesday in September).
September 14–20.	*Tuesday to Monday inclusive.* Examinations for admission to the Freshman class and to advanced standing.
September 20, 21.	*Monday and Tuesday.* Registration of new students and enrolment of students previously in residence.
September 22.	*Wednesday,* 9 a.m. Academic Year begins (fourth Wednesday in September).

REGISTRATION AND ENROLMENT

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REGISTRATION AND ENROLMENT OF UNDERGRADUATES

REGISTRATION. In September all new students, whether candidates for a degree or special students, must report at the Administration Building between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first semester, and fill out registration cards for the whole of the ensuing year. Failure to comply with this rule will be treated as late registration and a fee of three dollars will be charged. All new students must present at or before the time of registration all credentials necessary for admission as candidates for a degree or as special students.

In May of each year all undergraduates in residence, whether candidates for a degree or special students, must obtain at the Registrar's office registration cards which must be filled out with a statement of the courses elected for the whole of the ensuing year and returned not later than June 1. Failure to comply with this rule will be treated as late registration and a fee of three dollars will be charged. *Before filing their registration cards at the office, members of the Sophomore class who are candidates for the degree of Bachelor of Philosophy must comply with the requirements for concentration.* See pages 13, 14.

When semester courses are grouped in one paragraph (*e.g.* Biology 1, 2), they constitute a year course and neither semester may be elected independently unless specific statement to the contrary is made. In starred courses a final mark will be given at the end of the course, the mark given at the end of the first semester being regarded as temporary.

Changes in registration will be allowed only on presentation of sufficient reasons to the Committee on Registration and Attendance. Requests for permission to make changes in September must be presented to the committee between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of the first semester. Requests for permission to make changes for the second semester must be presented to the committee before the beginning of the examinations of the first semester, unless these requests are the result of failures, in which case they must be presented in writing to the Registrar two days before the opening of the second semester.

ENROLMENT. All students must report at the Registrar's office between 9 a.m. and 1 p.m. or between 2.30 p.m. and 5 p.m. on one of the two days preceding the opening of each semester and have their names checked as enrolled. Failure to report will be treated as late enrolment and a fee of three dollars will be charged.

GRADUATE STUDENTS

Graduate students must report to the Dean of the Graduate Department in No. 5 Wilson Hall between 9 a.m. and 1 p.m. or between 3 p.m. and 5 p.m. on the Monday or Tuesday preceding the opening of each semester. Before entering classes they must present their registration cards at the Registrar's office and be enrolled.

NEW REGULATIONS REGARDING SPECIAL EXAMINATIONS

After October 1, 1914, no student who fails to pass in a course will be allowed a second examination.

A student who fails in a required course will be obliged to repeat the course in class, or to make up the deficiency to the satisfaction of the department concerned by work in an approved summer school.

A student who is unavoidably absent from the regular semester examination and secures an excuse for such absence from the Dean, will be allowed a special examination.

Special examinations for students whose absences from the regular examinations of the first semester have been excused will be given only during the following Spring recess. Special examinations for students whose absences from the regular examinations of the second semester have been excused will be given only in the following September on as many days as may be necessary preceding the opening of the academic year; except that in the case of Seniors such examinations will be given on the Saturday and Monday after the examination period in June.

UNIVERSITY FEES

FEES FOR UNDERGRADUATES. *Tuition:* $52.50 a semester; $105 a year. *Incidentals:* $24 a semester; $48 a year. *Matriculation fee* (Freshman year only): $5. *Graduation fee* (Senior year only): $8.

The incidental expenses are for the printing of programs, examination papers, and the like, the use of the library and the gymnasium, heat for these buildings and for the recitation rooms, and the wages of servants to care for them.

Special students who are taking courses amounting to less than fifteen hours a week pay in proportion to the actual amount taken.

FEES FOR RESIDENT GRADUATE STUDENTS. *Tuition:* $75 a semester; $150 a year. *Graduation fee:* for the degree of Master of Arts, $15; for the degree of Master of Science, $15; for the degree of Doctor of Philosophy, $25.

Graduate students who are taking courses amounting to less than fifteen hours a week pay $15 a semester for each three-hour course.

A candidate in residence for the degree of Master of Arts or Master of Science who has paid full tuition for one year may, if necessary to the attainment of his degree, continue his studies for one year more without additional charge.

A candidate in residence for the degree of Master of Arts, who without remitting his studies becomes a candidate for the degree of Doctor of Philosophy, is credited with whatever tuition he has already paid, in case his previous work is allowed to count toward the higher degree.

A candidate for the degree of Doctor of Philosophy who has paid full tuition for two years may, if necessary to the attainment of his degree, continue his studies for two years more without additional charge.

FEES FOR NON-RESIDENT GRADUATE STUDENTS. *Registration fee:* $25. *Tuition:* $15 a semester; $30 a year. *Examination fee:* $15.

A non-resident candidate is entitled, upon payment of the registration and tuition fees, to take one three-hour course in residence. For each additional course taken in residence a fee of $15 a semester is charged.

A non-resident candidate who has paid tuition for two years may, if necessary to the attainment of his degree, continue his studies for one year more without additional charge, except for work taken at the University.

LABORATORY FEES. In addition to the regular fees mentioned above, the following fees are charged for laboratory courses. $4.50 for each three-hour semester course in *Botany*, *Biology*, *Geology*, *Elementary Chemistry*. $7.50 for each three-hour semester course in *Advanced Chemistry*, *Mechanical Engineering*, *Physics*, *Electrical Engineering*. These fees cover the cost of ordinary supplies; special supplies and breakage are charged extra.

SPECIAL FEES. Candidates for a first degree who do not pay four years full tuition fees must pay for all extra courses counted toward the degree at the rate of $7.50 per semester for each three-hour course. This amount must be paid at the beginning of the semester preceding the completion of the degree work. This rule does not apply to courses credited from other institutions or taken during the summer.

Candidates for the degree of A.M. or Sc.M. who do not pay full tuition fees for one year, and candidates for the degree of Ph.D. who do not pay full tuition fees for two years, must pay for all extra courses counted toward the degree at the rate of $7.50 per semester for each three-hour course. This amount must be paid at the beginning of the semester preceding the completion of the degree work. This rule does not apply to courses credited from other institutions.

PAYMENT OF UNIVERSITY BILLS

Every student, graduate or undergraduate, must pay in advance, at registration for each semester, all charges for tuition and incidentals for such semester.

Students occupying dormitory rooms must also pay at the above time all room charges for the semester.

Students taking laboratory courses must also pay at the above time all laboratory fees for the semester. These fees vary from $4.50 to $7.50 for each three-hour laboratory course.

At the beginning of the second semester all students occupying dormitory rooms or taking laboratory courses must, in addition to the payment of the above amounts, make a deposit of $5 toward charges for light or breakage during that semester.

Freshmen, candidates for degrees, must pay at registration for the first semester a matriculation fee of $5.

Candidates for graduation in any year must pay all graduation fees at the beginning of the second semester of that year.

REQUIREMENTS FOR DEGREES

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REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ARTS

I. PRESCRIBED SUBJECTS

Ancient Languages (either Latin or Greek, or both). Six hours. At least three hours must be taken in the Freshman year, and the six hours must be completed by the end of the Sophomore year.

French or *German.* Six hours. Either in French or in German the equivalent of the elementary and intermediate requirement for admission must be taken, or such portion of this requirement as was not presented for admission, and one three-hour year course in addition in the same language. At least three hours must be taken in the Freshman year. Candidates for the degree of Bachelor of Arts who present the full entrance requirement in both Greek and Latin and who elect six hours of Greek and Latin in college will not be required to take more than six hours of modern language in college.

Mathematics. Three hours. Freshman year.

English (*Rhetoric and Composition*). Three hours. First semester, Freshman year. Three hours. Second semester, Sophomore year.

English Literature. Three hours. Second semester, Freshman year. First semester, Sophomore year.

European History. Three hours. Sophomore or Junior year.

Physical or Natural Science. Some three-hour course continuous through the year. Freshman, Sophomore, or Junior year.

Economics and either Social or Political Science. Three hours. Sophomore, Junior, or Senior year.

Philosophy. Some three-hour course continuous through the year. Sophomore, Junior, or Senior year.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. Required Studies. *Latin* or *Greek*, three hours; *French* or *German*, three hours; *Mathematics*, three hours; *English*, three hours.

II. Elective Studies. One three-hour course continuous through the year must be chosen from the following list: *Latin, Greek, French, German, Chemistry, Physics, Botany, Biology, Geology, Mechanical Drawing.*

SOPHOMORE YEAR

That portion of the required work in ancient languages, modern languages, and English, not completed in the Freshman year, and other required and elective courses sufficient to make a total of fifteen hours a week.

JUNIOR YEAR

The required History and Physical or Natural Science, if not previously taken, and other required and elective courses sufficient to make a total of fifteen hours a week.

SENIOR YEAR

All required courses not previously taken, and elective courses sufficient to make a total of fifteen hours a week.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF PHILOSOPHY

I. PRESCRIBED SUBJECTS

A continuous course of three hours through the year in each of the following subjects:

Mathematics. This subject may be omitted by students who intend to take Argumentation in the Sophomore year. Freshman year.

English (*Rhetoric and Composition*). First semester, Freshman year. Second semester, Sophomore year.

English Literature. Second semester, Freshman year. First semester, Sophomore year.

French or *German.* Either in French or in German the equivalent of the elementary and intermediate requirement for admission must be taken, or such portion of this requirement as was not presented for admission, and one three-hour year course in addition in the same language. At least three hours must be taken in the Freshman year.

Biology. Freshman or Sophomore year.

Physics, *Chemistry*, *Geology*, or *Astronomy.* This requirement does not apply to students who presented Physics and Chemistry for admission. *Chemistry*, or *Geology*, or *Physics*, Freshman or Sophomore year. *Astronomy*, Sophomore year. Only one of this group required.

Classical Civilization (*Greek* 15, *Latin* 16). Freshman or Sophomore year. Freshman year for students who do not take Mathematics.

European History. Freshman, Sophomore, or Junior year.

Philosophy. Sophomore, Junior, or Senior year.

Economics and either Social or Political Science. Sophomore, Junior, or Senior year.

Argumentation (*English* 7, 8) (for students who did not take Mathematics in Freshman year). Sophomore year.

II. REQUIREMENTS ARRANGED BY YEARS

FRESHMAN YEAR

I. Required Studies. *English; French* or *German* (a course in continuation of a course presented for admission); *Mathematics* (for students who do not intend to take Argumentation in the Sophomore year); *Classical Civilization* (for students who do not take Mathematics); *Biology, Chemistry, Geology,* or *Physics.*

II. Elective Studies. One three-hour course continuous through the year must be chosen from the following list: *Latin, Greek, French, German, Classical Civilization, History, Chemistry, Physics, Botany, Biology, Geology, Mechanical Drawing.*

SOPHOMORE YEAR

That portion of the required work in modern languages not completed in the Freshman year.

Biology; for students who did not take this course in the Freshman year.

Physics, Chemistry, Astronomy, or *Geology;* for students who did not present both Physics and Chemistry for admission or take a course in Physical Science in the Freshman year.

Argumentation; for students who did not take Mathematics in the Freshman year.

Classical Civilization; for students who did not take this subject in the Freshman year.

English.

Other required and elective courses sufficient to make a total of fifteen hours a week.

JUNIOR YEAR

The required History, if not previously taken, and other required and elective courses sufficient to make a total of fifteen hours a week.

During the Junior and Senior years a student must take at least four courses outside the department chosen for special work. See Requirements for Concentration, pages 13, 14.

SENIOR YEAR

All required courses not previously taken, and elective courses sufficient to make a total of fifteen hours a week.

III. REQUIREMENTS FOR CONCENTRATION

At the close of the Sophomore year each candidate for the degree of Bachelor of Philosophy must choose from the following list a department in which he intends to do special work during the Junior and Senior years, and must elect at least three courses of three hours a year each in this department. If he has not already taken a three-hour year course in the department chosen, he must elect four courses. These courses must be selected in consultation with the head of the department and must be approved by him. When two departments are combined, the selection must be made in consultation with the head of the department first named.

At any time before the beginning of the Senior year a student may, with the approval of the Committee on Registration and Attendance, change the department in which he is to do his special work.

With the approval of the department in which the student is doing special work, he may count as the equivalent of one course, work which does not require regular class-room attendance.

LIST OF DEPARTMENTS IN WHICH SPECIAL WORK MAY BE TAKEN

Art.
Art, and Greek Literature and History.
Art, and Roman Literature and History.
Art, and Music.
Art, and History.
Astronomy.
Astronomy, and Civil Engineering.
Astronomy, and Physics.
Astronomy, and Mathematics.
Astronomy, and Geology.
Biblical Literature and History.
Biblical Literature and History, and Greek Literature and History.
Biblical Literature and History, and Philosophy.
Biology.
Botany.
Botany, and Biology.
Chemistry.
Civil Engineering.
Economics.
Education.
Education, and Philosophy.
Education, and Social and Political Science.
Education, and History.
Electrical Engineering.

English.
Geology.
Germanic Languages and Literatures.
Greek Literature and History.
Greek Literature and History, and Roman Literature and History.
Greek Literature and History, and Biblical Literature and History.
Greek Literature and History, and Indo-European Philology.
Greek Literature and History, and Art.
History.
Mathematics.
Mechanical Engineering.
Mechanics and Mechanical Drawing.
Mechanics, and any Engineering department.
Philosophy.
Physics (exclusive of Electrical Engineering).
Roman Literature and History.
Roman Literature and History, and Art.
Roman Literature and History, and Greek Literature and History.
Roman Literature and History, and Indo-European Philology.
Romance Languages and Literatures.
Social and Political Science.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN CIVIL ENGINEERING

For Students who entered before 1914

FRESHMAN YEAR

First Semester	*Second Semester*
Mathematics 17	Mathematics 18
Mathematics 13	Mathematics 16
Mech. Drawing 1	Mech. Drawing 2
English 1	English 2

and two of the following courses, Chemistry (if not presented for admission), French, German, subject to the direction of the Committee on Registration and Attendance. A student who presents three units in one foreign language for admission is not required to take a course in that language in college, but may elect any course he desires, subject to the approval of the head of the Department of Civil Engineering.

SOPHOMORE YEAR

First Semester	*Second Semester*
Mathematics 19	Mathematics 20
Mech. Drawing 3	Mech. Drawing 4
Civil Engineering 1	Civil Engineering 2
Physics 27	Physics 28
‡ Social Science	‡ Economics 1
	§ Civil Engineering 4
	Civil Engineering 6

JUNIOR YEAR

Civil Engineering 7	Civil Engineering 8
Mechanics 1	Mechanics 2
Geology 3	Geology 4
Physics 21	Physics 22
Astronomy 5	Civil Engineering 10
‖ Elect. Engineering 3	Civil Engineering 12
	‖ Civil Engineering 24
	‖ Civil Engineering 26
	‖ Civil Engineering 28

SENIOR YEAR

Civil Engineering 9	Civil Engineering 20
Civil Engineering 13	Civil Engineering 22
Civil Engineering 15	Civil Engineering 30
Civil Engineering 19	Civil Engineering 32
Civil Engineering 35	Civil Engineering 34
Mech. Engineering 19	Civil Engineering 36
	‖ Mech. Engineering 20
	Mech. Engineering 24
Mechanics 3	Mechanics 4

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‡ Or some year course in the Department of English, or History, or Philosophy, chosen with the approval of the head of the Department of Civil Engineering.

§ Civil Engineering 4 is taken during the spring recess.

‖ Seniors who have taken Mechanical Engineering 19, 20 will take Electrical Engineering 3 and Civil Engineering 24, 26, 28.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN CIVIL ENGINEERING

For Students who enter in 1914 or after

FRESHMAN YEAR

First Semester	*Second Semester*
Mathematics 13	Mathematics 16
Mathematics 17	Mathematics 18
Mech. Drawing 1	Mech. Drawing 2
English 1	Civil Engineering 2

and two of the following courses, Chemistry (if not presented for admission), French, German, subject to the direction of the Committee on Registration and Attendance. A student who presents three units in one foreign language for admission is not required to take a course in that language in college, but may elect any course he desires, subject to the approval of the head of the Department of Civil Engineering.

SOPHOMORE YEAR

Mathematics 19	Mathematics 20
Physics 27	Physics 28
Mech. Drawing 3	English 2
‡ Economics 1	‡ Soc. or Pol. Science 1
§ Civil Engineering 1	‖ Civil Engineering 4
Civil Engineering 3	Civil Engineering 6
Civil Engineering 5	Civil Engineering 12

JUNIOR YEAR

Civil Engineering 7	Civil Engineering 16
Mechanics 1	Mechanics 2
Geology 3	Geology 4
Physics 21	Physics 22
Astronomy 5	Civil Engineering 10
Elect. Engineering 3	Civil Engineering 14
	Civil Engineering 26

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‡ Or some year course in the Department of English, or History, or Philosophy, chosen with the approval of the head of the Department of Civil Engineering.

§ Civil Engineering 1 is taken in September during the two weeks preceding the opening of college.

‖ Civil Engineering 4 is taken during the spring recess.

SENIOR YEAR

First Semester	*Second Semester*
Mech. Engineering 19	Mech. Engineering 20
Mech. Engineering 15	Mech. Engineering 24
Mechanics 3	Mechanics 4
Civil Engineering 37	Civil Engineering 38
Civil Engineering 45	Civil Engineering 40
‡Option	Civil Engineering 34
	Civil Engineering 42 or 46
	‡Civil Engineering 36

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

For Students who entered before 1914

FRESHMAN YEAR

First Semester	*Second Semester*
Mathematics 17	Mathematics 18
Mathematics 13	Mathematics 16
Mech. Drawing 1	Mech. Drawing 2
English 1	English 2

and two of the following courses: Chemistry (if not presented for admission), French, German, subject to the direction of the Committee on Registration and Attendance. A student who presents three units in one foreign language for admission is not required to take a course in that language in college, but may elect any course he desires, subject to the approval of the head of the Department of Electrical Engineering.

SOPHOMORE YEAR

Mathematics 19	Mathematics 20
Mech. Drawing 3	Mech. Drawing 4
Physics 27	Physics 28
§Soc. or Pol. Science 1	§Economics 1
Mech. Engineering 1	Mech. Engineering 2
‖An elective course	Mech. Engineering 8

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‡ In special cases, subject to the approval of the head of the Department of Civil Engineering, the courses in Engineering or Science may be substituted for thesis.

§ Or some other course, not technical, chosen with the approval of the head of the Department of Electrical Engineering.

‖ A three-hour course chosen with the approval of the head of the Department of Electrical Engineering.

JUNIOR YEAR

First Semester	*Second Semester*
Mechanics 1	Mechanics 2
Elect. Engineering 1	Elect. Engineering 2
Mech. Engineering 3	Elect. Engineering 8
Mech. Engineering 9	Mech. Engineering 10
Mech. Engineering 15	Mech. Engineering 16
Physics 21	Physics 22

SENIOR YEAR

Mechanics 3	Mechanics 4
Mathematics 9	Mech. Engineering 24
Physics 23	Physics 14
Mech. Engineering 15	Mech. Engineering 16
Elect. Engineering 9	Elect. Engineering 10
Elect. Engineering 7	Elect. Engineering 14
Elect. Engineering 19	Elect. Engineering 18
	Elect. Engineering 20
	Civil Engineering 26

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

For Students who enter in 1914 or after

FRESHMAN YEAR

First Semester	*Second Semester*
Mathematics 17	Mathematics 18
Mathematics 13	Mathematics 16
Mech. Drawing 1	Mech. Drawing 2
English 1	English 2

and two of the following courses: Chemistry (if not presented for admission), French, German, subject to the direction of the Committee on Registration and Attendance. A student who presents three units in one foreign language for admission is not required to take a course in that language in college, but may elect any course he desires, subject to the approval of the head of the Department of Electrical Engineering.

SOPHOMORE YEAR

Mathematics 19	Mathematics 20
Physics 27	Physics 28
Physics 21	Physics 22

First Semester	*Second Semester*
‡Soc. or Pol. Science 1	‡Economics 1
Mech. Drawing 3	Mech. Engineering 8
Mech. Engineering 1	Mech. Engineering 2

JUNIOR YEAR

Mechanics 1	Mechanics 2
Elect. Engineering 1	Elect. Engineering 2
Elect. Engineering 5	Elect. Engineering 6
Mathematics 9	Elect. Engineering 8
Mech. Engineering 9	Mech. Engineering 10
Mech. Engineering 15	Mech. Engineering 16
Mech. Engineering 3	

SENIOR YEAR

Mechanics 3	Mechanics 4
	Mech. Engineering 24
Physics 23	Civil Engineering 18
Elect. Engineering 9	Elect. Engineering 14
Elect. Engineering 11	Elect. Engineering 16
Elect. Engineering 17	Elect. Engineering 18
Elect. Engineering 19	Elect. Engineering 20
Mech. Engineering 19	Mech. Engineering 20
	Civil Engineering 26
	§ An elective course

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

FRESHMAN YEAR

First Semester	*Second Semester*
Mathematics 17	Mathematics 18
Mathematics 13	Mathematics 16
Mech. Drawing 1	Mech. Drawing 2
English 1	English 2

and two of the following courses, Chemistry (if not presented for admission), French, German, subject to the direction of the Committee on Registration and Attendance. A student who presents three units in one foreign language for admission is not required to take a course in that language in college, but may elect any course he desires, subject to the approval of the head of the Department of Mechanical Engineering.

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‡Or some other course, not technical, chosen with the approval of the head of the Department of Electrical Engineering.

§ A three-hour course chosen with the approval of the head of the Department of Electrical Engineering.

SOPHOMORE YEAR

First Semester	*Second Semester*
Mathematics 19	Mathematics 20
Mech. Drawing 3	Mech. Drawing 4
Physics 27	Physics 28
‡ Soc. or Pol. Science 1	‡ Economics 1
Mech. Engineering 1	Mech. Engineering 2
§ An elective course	Mech. Engineering 8

JUNIOR YEAR

Mech. Engineering 17	Mech. Engineering 18
Mech. Engineering 15	Mech. Engineering 16
Mech. Engineering 3	Mech. Engineering 4
Mech. Engineering 9	Mech. Engineering 10
Mechanics 1	Mechanics 2
Physics 5	Physics 6

SENIOR YEAR

Mech. Engineering 21	Mech. Engineering 22
Mech. Engineering 5	Mech. Engineering 14
Mech. Engineering 19	Mech. Engineering 20
Mechanics 3	Mechanics 4
Elect. Engineering 1	Elect. Engineering 2
Mech. Engineering 11	Mech. Engineering 12
	Mech. Engineering 24
Mech. Engineering 25	Mech. Engineering 26
	Civil Engineering 18
	Civil Engineering 26

NOTE. For students who enter in 1914 or after, the elective course and Mechanical Drawing 4 will be dropped from the Sophomore year and Physics 5, 6 will be required. Electrical Engineering 1, 2 will be required in the Junior year. A three-hour elective course, through the year, chosen with the approval of the head of the Department of Mechanical Engineering, will be added in the Senior year.

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‡ Or some year course in the Department of English, or History, or Philosophy, chosen with the approval of the head of the Department of Mechanical Engineering.

§ A three-hour course chosen with the approval of the head of the Department of Mechanical Engineering.

COURSES OF INSTRUCTION

WHEN semester courses are grouped in one paragraph (e.g. *Biology 1, 2*), *they constitute a year course and neither semester may be elected independently unless specific statement to the contrary is made. In starred courses a final mark covering the work of the course as a whole is given at the end of the course, the marks given at the end of the first semester being regarded as temporary. When the time of meeting is not announced, it will be arranged by the instructor at the beginning of the semester.*

I. ART ‡

William Carey Poland, A.M., Litt.D., *Professor of the History of Art*

1, 2. *History of Art from Antiquity through the Renaissance*

First semester, ancient art, chiefly Greek and Roman. Second semester, Early Christian, Byzantine, Romanesque, and Gothic art, and the art of the fifteenth and sixteenth centuries; the effect on art of the dominant motives of the epoch, the development of art in the different countries of Europe, the great masters and their most significant works. Text-book, lectures, lantern views.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. *Mon.*, *Wed.*, *Th.*, *at 10.20.*

3, 4. *Modern Art, and Theory and Criticism of the Fine Arts*

First semester, the seventeenth and eighteenth centuries. Second semester, the nineteenth century, with a study of the more important facts and laws of artistic production. Text-book, lectures, special assigned topics, lantern views.

Three hours. Through the year. Course 3 is elective for students who have completed 2. Course 4 is elective for students who have completed 1, or 2, or 3. *Mon.*, *Th.*, *Fri.*, *at 9.20.*

5,* 6.* *Renaissance Art, Advanced Course*

Critical study of the art of the fifteenth and sixteenth centuries, particularly Italian. A more detailed study of the spiritual conditions, the influences, and the masters, than in 2.

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‡ For arrangements with the Rhode Island School of Design, see the Catalogue, page 157.

Three hours. Through the year. Elective by written consent of the instructor for students who have credit for 2. *Tu., Th., Sat., at 12.20.*

7, 8. *Seminary in Greek and Roman Sculpture*

An archaeological course based on Overbeck's *Schriftquellen.*

Three hours. Through the year. Elective for Graduates who read Greek and Latin. It is advised that application be made to Professor Poland at an early date.

[9. *Seminary Study of the Acropolis of Athens*]

Critical reading, in Greek, of Pausanias' account of the Acropolis of Athens; lectures and illustrations.

Three hours. First semester. Elective for Graduates who read Greek and Latin. Not offered in 1914–15.

[10. *Seminary in Classical Architecture*]

Critical study; reading of Vitruvius in Latin; discussion of the principles followed by the Greek and Roman architects, and of the influence of Vitruvius upon the Renaissance.

Three hours. Second semester. Elective for Graduates. Offered if three or more elect the course. Not offered in 1914–15.

15,* 16.* *Freehand Drawing*

Training of hand and eye by study in charcoal and pencil of casts and still-life objects.

One hour. Two hours of drawing. Through the year. Elective for Undergraduates. Given at the Rhode Island School of Design. Hours to be arranged with the Director.

17,* 18.* *Advanced Drawing and Color Work*

Practical work in light and shade, and in color.

Three hours. Six hours of drawing, or four hours of drawing and one hour lecture on Historic Ornament. Through the year. Elective for students who have credit for or are taking 1, 2, and who have credit for 15, 16. Given at the Rhode Island School of Design. *Mon., Tu., Wed., at 2.* Lecture hour to be arranged with the Director.

II. ASTRONOMY

————————————, *Professor of Astronomy*

ROLAND GEORGE DWIGHT RICHARDSON, PH.D., *Acting Director of the Ladd Observatory*

CLINTON HARVEY CURRIER, A.M., *Instructor in Astronomy*

JOHN EDWARDS, *Assistant in the Ladd Observatory*

1, 2. *General Course*

Designed for general culture and preparation for technical work. Fundamental conceptions; methods of professional study. First semester, chief topic: the movements of the heavenly bodies. Second semester, chief topics: the physical condition of the heavenly bodies; the sidereal universe. *Mr.* CURRIER.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for Mathematics 2. *Mon., Wed., Th., at 10.20.* Observations at Ladd Observatory.

5. *Field Astronomy*

The astronomical problems of geodesy: azimuth, time, latitude, longitude. Computations and observations. *Mr.* CURRIER.

Four hours. First semester. Required of candidates for the degree of Bachelor of Science in Civil Engineering. Elective for Juniors and Seniors who have credit for Mathematics 16. *Mon., Tu., Th., Fri., at 2.20.* Observations at Ladd Observatory.

[7, 8. *Advanced Astronomy*]

Designed for students who wish to specialize in Astronomy.

Three hours. Through the year. Elective for approved students who have credit for 1, 2. Not offered in 1914–15.

[9, 10. *Research Course*]

Special advanced work. Subjects arranged to meet the requirements of individual students.

Elective for Graduates and approved Undergraduates. Not offered in 1914–15.

III. BIBLICAL LITERATURE AND HISTORY‡

Henry Thatcher Fowler, Ph.D., *Professor of Biblical Literature and History*

Nathan Stern, Ph.D., *Lecturer in Biblical Literature and History*

LANGUAGES

1, 2. *Elementary Hebrew*

Grammar; exercises in writing Hebrew; translation of parts of Genesis and Deuteronomy. *Dr.* Stern.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

3, 4. *Historical Hebrew*

Reading of the books of Samuel and Kings with special attention to the acquisition of a vocabulary; review of the elements of Hebrew grammar and study of syntax. *Dr.* Stern.

Three hours. Through the year. Elective for students who have credit for 1.

5, 6. *Hebrew Literature*

Psalm literature. Critical translation of the lyric poetry of the Old Testament; investigation of the characteristics and development of Hebrew poetry. In succeeding years corresponding courses in the Wisdom, Legal, and Prophetic literature of the Old Testament will be offered. *Professor* Fowler.

Three hours. Through the year. Elective for Graduates and approved Undergraduates.

7. *Textual Criticism of the Old Testament*

The principles and method of textual criticism, in connection with the study of one of the shorter prophetic books. *Dr.* Stern.

Three hours. One semester. Offered if applied for by Graduates.

8. *Biblical Aramaic*

Grammar and reading of the Aramaic portions of the Old Testament. *Dr.* Stern.

Three hours. One semester. Offered if applied for by students who have credit for 1.

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‡ For conditions under which students may receive credit in the Newton Theological Institution for work done in this department, see the Catalogue, page 157.

9, 10. *Elementary Arabic*

Grammar; exercises in writing Arabic; translation of prose selections. *Professor* Fowler.

Two hours. Through the year. Elective for Seniors and Graduates.

[11, 12. *Gospels and Epistles*]

First semester, the Gospel and Epistles of John, the Gospel of Mark. Second semester, the Gospels of Matthew and Luke.

Not offered in 1914–15.

13, 14. *Acts and Pauline Epistles*

Characteristics of Hellenistic Greek; translation, and investigation of date, authorship, and thought. First semester, Acts and Thessalonians. Second semester, Galatians, Corinthians, and Romans. *Professor* Fowler.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Either semester may be elected independently. *Wed., Fri., Sat., at 11.20.*

LITERATURE AND HISTORY IN ENGLISH‡

15, 16. *Old Testament Literature and History*

Includes nearly the entire Old Testament literature and history. Emphasis placed upon the connection between the literature and the history. In connection with course 17, 18, gives a comprehensive view of Biblical literature and history. The books are read in the best English translations. First semester, early Semitic history, Hebrew literature and history to the close of the United Kingdom. Second semester, Hebrew and Jewish literature and history from the division of the kingdom to the conquest of Alexander. *Professor* Fowler.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. *Mon., Wed., Th., at 10.20.*

[17, 18. *New Testament Literature and History*]

Includes a large part of the Jewish writings from the conquest of Alexander to the destruction of Jerusalem, and the entire New Testament studied in its Jewish setting. Emphasis placed upon the connection between the literature and the history. In connection with course 15, 16, gives a comprehensive view of Biblical literature and history. The books are read in the best English translations. First semester, Jewish literature and history from the beginning of the Greek period to the destruction of Jerusalem, the Gospels and other sources for the life of Christ. Second semester, outline of the life of Christ, literature and history of the Apostolic age. *Professor* Fowler.

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‡ Course 19, 20 gives a rapid survey of the Bible as a part of the world's literature. It is designed especially for those who do not expect to pursue further courses in this department. Courses 15, 16 and 17, 18 are introductory to more detailed courses in the University or the Theological Seminary. They are also designed for those who, without intending to specialize in this field, desire a comprehensive view of the nature and results of the historical as well as the literary study of the Bible.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. Not offered in 1914–15.

19, 20. *The English Bible as Literature*

An outline of the literary history of the Old and New Testaments; the literary forms represented in the Bible; the place of the Bible in English literature. Emphasis placed upon the literature itself and its connection with the present. Lectures and assigned readings from the English Bible. First semester, Old Testament literature from the beginning to the close of the Persian Age. Second semester, the completion of the Old Testament, and the New Testament literature. *Professor* Fowler.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently. *Mon., Tu., Th., at 11.20.*

21,* 22.* *Biblical Seminary*

Subject for 1914–15: Sunday-school Organization and Instruction. *Professor* Fowler.

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors.

23. *Principles of Historical Criticism and Research*

The general principles of historical criticism and the literature of historical theory. *Professor* Fowler.

One hour. One semester. Elective for Graduates of one year's standing. Required of all candidates for the degree of Doctor of Philosophy in Biblical Literature and History.

30. *History of Religion*

An outline study of the history of the principal religions of the world.

This course is the same as course 30 offered by the Department of Philosophy. *Professors* Fowler *and* Jones.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

IV. BIOLOGY

Albert Davis Mead, Ph.D., Sc.D., *Professor of Biology*
Frederic Poole Gorham, A.M., *Professor of Bacteriology*
Herbert Eugene Walter, Ph.D., *Associate Professor of Biology*
Philip Henry Mitchell, Ph.D., *Assistant Professor of Physiology*
John Burnham Ferguson, A.B., M.D., *Demonstrator in Anatomy*
Ralph Gibney Hurlin, A.M., *Assistant in Biology*

1, 2. *General Biology*

The structure of animals and plants; elementary vital phenomena; the functions of organs; the development of organisms; classification. An outline of the more important biological theories, such as evolution, natural selection, variation, mutation and heredity, and the principles upon which modern hygiene and sanitation are based. The course will introduce the student to the use of the microscope, laboratory technic, and to scientific methods of observation and experiment. *Professor* Gorham.

Three hours. Six hours of attendance. Through the year. Required in Freshman or Sophomore year of candidates for the degree of Bachelor of Philosophy. Elective for Undergraduates. Lectures, *Mon., Tu., Th., at 3.20.* Laboratory, *1st div., Mon., Tu., Th., at 2.20; 2d div., Tu., Th., Sat., at 12.20.*

3, 4. *Comparative Anatomy of Vertebrates*

Intended not only for the general student, but also for those who are particularly interested in zoölogy and for those who expect to study medicine. The structure and significance of the various organs of vertebrates with particular reference to man. Students are permitted to attend clinics and autopsies at the Rhode Island Hospital. Laboratory work and lectures. *Professor* Walter.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors who have credit for 1, 2. *Mon., Wed., Fri., at 8.*

5, 6. *Anatomy of the Nervous System*

A study of the gross and microscopic anatomy of the brain, nerves, and sense organs in man and other vertebrates. Designed particularly for those intending to study medicine or psychology. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2.

7, 8. *Embryology and Histology*

The origin of the individual and the developmental process from the egg to the adult; the material basis of heredity; the composition of the body and its organs from the viewpoint of its vital units, the cells. Practice in micro-technic. Adapted to the requirements of general students and of those intending to study medicine. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2. *Tu.*, *Th.*, *Sat.*, *at 8.*

9, 10. *Advanced Histology and Pathology*

Work in micro-technic and in normal and pathological histology. Adapted to individual requirements. *Professor* MEAD.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 1, 2, and 7, 8.

11, 12. *General Physiology*

General vital processes in plants and animals; the more special phenomena in higher animals, with their application to human physiology. Designed not only as an introduction to further work, but also as a general view of physiology. Lectures and laboratory work. *Professor* MITCHELL.

Three hours. Six hours of attendance. Through the year. Must be preceded by 1, 2, and by Chemistry 1, 2. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon.*, *Tu.*, *Th.*, *at 3.20.*

13, 14. *Chemical Physiology*

The chemistry of proteins, carbohydrates, and fats; the physiology of the digestive system, with the study of secretions and of artificial salivary, gastric, and pancreatic digestions; examination of blood, bile, and urine; the analysis of foods, with special reference to milk. Designed for those who are interested in physiology either from a medical or a general standpoint, and for those who are specializing in chemistry and desire a knowledge of vital chemical processes. *Professor* MITCHELL.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for or are taking Chemistry 7, 8. *Tu., Fri., Sat., at 10.20.*

15. *Invertebrate Zoölogy*

A study of the natural history of invertebrate animals, particularly marine forms, insects, and protozoa. Lectures with laboratory and field work. *Professor* WALTER.

Three hours. Six hours of attendance. First semester. Elective for Undergraduates. *Tu., Th., Sat., at 8.*

16. *Bacteriology*

A general discussion of bacteria in all their relations, with special attention in the laboratory to the methods of studying bacteria, including the isolation, systematic study, and determination of unknown species. Lectures and laboratory work. *Professor* GORHAM.

Three hours. Six hours of attendance. Second semester. Elective for Juniors and Seniors, and for Sophomores who are not taking any other course in the department. *Mon., Wed., Th., at 10.20.*

17, 18. *Advanced Bacteriology*

Practical work in the preparation of culture media; methods of sterilization and disinfection; qualitative and quantitative biological examination of water, milk, air, soil, and sewage; study of certain pathogenic organisms, with the determination of their pathogenic properties, and the methods of bacteriological diagnosis of disease. Laboratory work and seminary. *Professor* GORHAM.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 16.

20. *Ornithology*

A study of birds regarded as a group of living animals, in relation to their environment. Lectures and early morning field trips for the identification of wild birds during their spring migration. *Professor* WALTER.

One hour. Two hours of attendance. Second semester. Elective for Undergraduates.

[22. *Evolution*]

The history of biology, principles of classification, geographical distribution, heredity, natural selection, variation, Mendelism, and the

relationship of man to the lower animals. Designed particularly for those who have not studied biology. Lectures and assigned reading.

Three hours. Second semester. Elective for Juniors and Seniors. Not offered in 1914–15.

24. *Physiology*

A general survey of the activities of living organisms with special reference to the human body, including some applications of modern physiology to healthful living. Lectures and assigned reading. *Professor* Mitchell.

Three hours. Second semester. Elective for Juniors and Seniors. *Mon., Wed., Th., at 10.20.*

31, 32. *Human Anatomy*

A course in practical dissection. Students are permitted to attend clinics and autopsies at the Rhode Island Hospital. *Dr.* Ferguson.

Three hours. Through the year. Elective for Graduates.

33, 34. *Biological Research*

Research work arranged to meet the requirements of individual students. *Professor* Mead.

Three to twelve hours. Through the year. Elective for Graduates.

35, 36. *Advanced Physiology*

Laboratory work and seminary. *Professor* Mitchell.

Three to twelve hours. Through the year. Elective for Graduates who have sufficient knowledge of chemistry and physiology.

37, 38. *Bacteriological Research*

Research work arranged to meet the requirements of individual students. *Professor* Gorham.

Three to twelve hours. Through the year. Elective for Graduates who have credit for 16 and 17, 18.

39, 40. *Biological Theories and Problems*

Seminary course. *Professor* Mead.

One to three hours. Through the year. Elective for Graduates.

41, 42. *Zoölogical Seminary*

Reading and discussion of German zoölogical literature selected with reference to the needs of individual students. *Professor* Walter.

One hour. Through the year. Elective for Graduates.

V. BOTANY

Harlan Harvey York, Ph.D., *Assistant Professor of Botany*
James Franklin Collins, Ph.B., *Demonstrator in Botany*
Walter Henry Snell, A.B., *Assistant in Botany*

1, 2. *Plant Biology, General Course*

Designed not only as a general culture course, giving the student a definite conception of the vital importance of botany as related to modern life, but also as a preliminary training for those who contemplate further work in botany. The origin, development, structure, physiology, and classification of plants. A discussion of biological subjects of fundamental human interest, such as evolution, the origin of new species, and the general laws of inheritance in plants.

Three hours. Six hours of attendance. Through the year. Elective for Undergraduates. Lectures, *Mon., Wed., at 8.* Laboratory, *Mon., Tu., 2.20 to 4.20.*

3, 4. *Physiological Anatomy*

Intended for students who are planning to study medicine, agriculture, forestry, or plant pathology, as well as for those who expect to teach or pursue further work in botany. The origin, minute structure, and physiological function of plant tissues; reproduction, cytology, methods in micro-technic. The biological purpose of this course is to help the student to understand how plants, by the differentiation of cells and their association into tissues adapted to perform different kinds of work, are able to meet the conditions of their environment.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2, or its equivalent.

5, 6. *Comparative Morphology and Phylogeny*

Designed not only for the general student, but for those who expect to teach, and for those who are particularly interested in botany. Methods in micro-technic. Intended to acquaint the student with a wider range of scientific methods in plant biology through a more comprehensive knowledge of plant forms and the more fundamental conclusions of morphology and phylogeny. Special emphasis will be placed upon the evolution, morphology, and classification of plants.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2, or its equivalent.

7, 8. *Special Course*

Special work on various phases of botany arranged to meet the requirements of individual students. May be taken in successive years. Students electing this course must plan it definitely, in consultation with the instructor, before June 1 of the preceding academic year.

One or more hours. Through the year. Either semester may be elected independently. Elective for Graduates, and for approved Juniors and Seniors.

9. *Diseases of Plants*

Designed to give the student a definite idea of one of the most fundamental relations of botany to the food supply of man, and to stimulate further inquiry into an inexhaustible field of science. An introduction to the nature, causes, and remedies of diseases of plants. Lectures and demonstrations.

One hour. Two hours ot attendance. First semester. Elective for Undergraduates. Lectures, *Fri. at 8.*

10. *Trees*

Intended to familiarize the student with the common native and introduced trees of Rhode Island. Special attention will be given to their structure and economic value. Lectures and field work.

One hour. Two hours of attendance. Second semester. Elective for Undergraduates. Lectures, *Fri. at 8.*

[11, 12. *Physiology*]

Includes a study of imbibition, diffusion, osmosis, turgor, and the retention of bodily form; relation of soil and solutes to the plant; transpiration and exudation; movement of materials within the plant body; photosynthesis; respiration; growth and movement; reproduction and death.

Three hours. Six hours of attendance. Through the year. Elective for Juniors and Seniors who have credit for 1, 2, and 3, 4, or 5, 6, and for Graduates. Not offered in 1914–15.

13, 14. *Plant Pathology*

General course, including the identification of bacteria and fungi which cause diseases in our more common cultivated and native plants and native and introduced trees; their manner of infection and effects on their hosts, methods of prevention and control, and methods of culture and inoculation which are employed in the laboratory in the study of diseases of plants.

Three hours. Six hours of attendance. Through the year. Must be preceded by 1, 2, and 3, 4, or 5, 6.

VI. CHEMISTRY

JOHN HOWARD APPLETON, A.M., Sc.D., *Newport-Rogers Professor of Chemistry*

JOHN EMERY BUCHER, PH.D., *Associate Professor of Organic Chemistry*

HAROLD EUGENE BIGELOW, PH.D., *Assistant Professor of Chemistry*

NORMAN EDWARD HOLT, PH.D., *Instructor in Chemistry*

SAMUEL TOMLINSON ARNOLD, A.B., *Instructor in Chemistry*

______________________, *Assistant in Chemistry*

______________________, *Assistant in Chemistry*

1, 2. *Descriptive Chemistry* ‡

Non-metals; metals, their metallurgy, compounds, and practical applications; theoretical chemistry. Lectures with experiments; written exercises; individual laboratory work. *Professor* BIGELOW *and Mr.* ARNOLD.

Three hours. Through the year. Elective for Undergraduates. *1st div., Mon., Th., at 10.20; 2d div., Tu., Fri., at 10.20.* Laboratory hours to be arranged with the instructor.

3, 4. *Qualitative and Quantitative Analysis*

Properties of the metallic elements; their separation from certain of their compounds. The principal non-metals and the acids formed by them; methods of separation and recognition of acids and acid radicles. Quantitative precipitations and separations of the most important elements and compounds; the principles upon which quantitative apparatus is constructed. Laboratory work; recitations in qualitative analysis and in chemical philosophy; exercises in stoichiometry. *Professor* Bigelow *and Mr.* Arnold.

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‡ Credit for the entrance requirement in Chemistry admits only to 1, 2, which may be taken also without previous preparation. Students who wish to enter more advanced courses without taking 1, 2 must pass a special test at the time of the entrance examination in Chemistry. This test will cover the following topics: 1. All of the non-metals with their principal compounds and the processes of manufacture of the chief commercial products from non-metals. 2. About thirty important metals, their occurrence, preparation from the ore, the preparation and uses of their chief compounds. 3. The general principles of chemical action which depend upon physical laws. 4. Methods of making chemical computations of moderate difficulty. Preparation for this test may require the equivalent of six hours a week for one school year.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2. *1st div., Fri. at 11.20; 2d div., Sat. at 10.20.* Laboratory hours to be arranged with the instructor.

5, 6. *Quantitative Analysis, Advanced Course*

Assaying of metallic ores; analysis of agricultural materials; testing of chemicals used in textile establishments, etc. *Professor* Bigelow.

Six hours. Twelve hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3, 4. Laboratory hours to be arranged with the instructor.

7, 8. *Organic Chemistry*

Preparation and analysis of representative organic compounds. Lectures, recitations, and laboratory work. *Professor* Bucher *and Dr.* Holt.

Six hours. Through the year. Elective for approved Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

10. *Assaying*

Professor Bucher *and Dr.* Holt.

Six hours. Twelve hours of attendance. Second semester. Elective for Seniors and Graduates who have credit for 1-6.

12. *Organic Dyes*

The chemistry and use of mordants, dyes, etc. *Professor* Bucher.

Three hours. Six hours of attendance. Second semester. Elective for approved Seniors and Graduates.

[13, 14. *Industrial Chemistry*]

Lectures and laboratory work.

Three to six hours. Six to twelve hours of attendance. Through the year. Elective for approved Graduates. Either semester may be elected independently. Not offered in 1914–15.

[15, 16. *Physical Chemistry*]

Lectures and laboratory work.

Three hours. Through the year. Elective for approved Juniors, Seniors, and Graduates. Not offered in 1914–15.

17, 18. *Physical Chemistry, Advanced Course*

Lectures and laboratory work. *Professor* Bucher *and Dr.* Holt.

Three hours. Through the year. Elective for approved Graduates who have credit for Physics 1-4, and have credit for or are taking Mathematics 7, 8.

[19. *Organic Chemistry, Advanced Course*]

Three hours. First semester. Elective for approved Graduates. Not offered in 1914–15.

[20. *Inorganic Chemistry, Advanced Course*]

Three hours. Second semester. Elective for approved Juniors, Seniors, and Graduates. Not offered in 1914–15.

21, 22. *Organic Preparations, Advanced Course*

Professor Bucher *and Dr.* Holt.

Three or more hours. Through the year. Elective for approved Juniors, Seniors, and Graduates.

23, 24. *Inorganic Preparations, Advanced Course*

Professor Bucher *and Dr.* Holt.

Three or more hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 7, 8.

25, 26. *Research Work in Chemistry*

Professor Bucher.

Three or more hours. Through the year. Elective for Graduates.

27, 28. *Conference on Special Topics in Chemistry*

Professor Bucher.

One hour. Through the year. Elective for approved students.

29, 30. *Industrial Chemistry and Research*

Professor Bucher.

Three or more hours. Through the year. Elective for approved Graduates.

VII. CIVIL ENGINEERING‡

For Students who entered before 1914

JOHN EDWARD HILL, C.E.M., Sc.D., *Professor of Civil Engineering*
HARDY CROSS, Sc.B., C.E.M., *Assistant Professor of Civil Engineering*
LEIGHTON TEETERICK BOHL, Sc.B., *Instructor in Civil Engineering*

1a, 1b; 2a, 2b. *Surveying*

Theory and practice of plane surveying; use of tape, compass, level, and transit; adjustment of instruments; pen topography; contour drawing; conventional signs; plotting. *Professor* HILL, *Mr.* BOHL, *and* Assistants.

Three hours and two hours, and one hour and two hours. Through the year. Elective for students who have credit for Mathematics 17 and Mechanical Drawing 2. Parts a and b may not be elected separately. First semester, *Mon., Tu., Th., at 11.20; Mon., Th., 2 to 5.* Second semester, *Mon. at 11.20; Mon., Th., 2 to 5.*

4. *Surveying, Advanced Field Work*

Use of stadia, plane table, and barometer; precise base-line measurement with steel tape; triangulation; topography. *Professors* HILL *and* CROSS, *Mr.* BOHL, *and* Assistants.

One hour. Spring recess. Elective for students who have credit for 1 and are taking 2.

6, 7, 8, 9. *Railroad Engineering*

Theory, location, construction, and economics of railroad engineering. Lectures, recitations, field work, and drafting. Second semester, railroad curves and practical problems. First semester, actual location of a line about two miles long, map, and estimate of cost. Second semester, railroad track and track work; maintenance of way department; economics of location. First semester, earthwork and its cost; rock excavation; tunneling. *Professors* HILL *and* CROSS, *Mr.* BOHL.

Two, three (six hours of field work), two, and two hours. Second, first, second, and first semesters. Courses 6 and 7 are elective for students who have credit for 2. Courses 8 and 9 are elective for Juniors and Seniors. Second semester, *Tu., Th., at 11.20.* First semester, *Wed., 9.20 to 5.* Second semester, *Wed., Fri., at 11.20.* First semester, *Fri. at 9.20; Mon., 2.20 to 5.20.*

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‡ All courses in this department are required for the degree of Bachelor of Science in Civil Engineering.

10. *Geodesy*

Problems in geodetic surveying, with sufficient theory for a proper understanding of the formulas used. Lectures, recitations, and computations. *Professor* HILL *and Mr.* BOHL.

Two hours. One hour of recitation and two hours of computations. Second semester. Elective for students who have credit for 4, and Astronomy 5. *Tu. at 9.20; 2.20 to 4.20.*

12. *Highway Engineering*

Economics and location of country roads; surveys, grades, drainage, and foundations; construction and maintenance; economics and design of pavements; dust prevention and preservation of macadam roads; use of bituminous materials in the construction and maintenance of roads; methods of testing road materials; roads and pavements in foreign countries; systems of administration and maintenance; highway laws. Lectures, recitations, inspection trips, and seminary work. *Mr.* BOHL.

Three hours. Second semester. Elective for Sophomores, Juniors, and Seniors. *Mon., Tu., Th., at 8.*

13. *Hydraulic Engineering*‡

Consideration of water supply mainly from a sanitary standpoint. A general course designed to give the chemical and biological aspects of water supply without laboratory work. Lectures, recitations, and seminary work. *Professor* HILL.

Two hours. First semester. Elective for Juniors and Seniors. *Mon., Th., at 10.20.*

15. *Theory of Structures*

Theory of statically determinate structures, as illustrated by the plate girder and bridge and roof trusses. Assumptions necessary in the more common cases of statical indetermination. Elements of the elastic theory of structures and applications. Analytical and graphical methods. The object is to develop accuracy in the application of the principles of mechanics to the practical problems of structural design and to establish a correct idea of the interrelation of theoretical investigations and practical details. Lectures, recitations, computations. *Professor* CROSS *and Mr.* BOHL.

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‡ Courses 13, 30, and 32 cover the general subject of sanitation.

Five hours. First semester. Elective for students who have credit for Mechanics 2. *Tu., Wed., Th., at 8; Tu., Wed., at 9.20.*

19. *Bridge Design*

Complete design and shop details of a through plate girder railway bridge or similar structure, accompanied by lectures and discussions. Individual data are given, business-like methods are required, and a practical attitude towards the work is encouraged. Lectures, computations, drafting. *Professor* Cross *and Mr.* Bohl.

Three hours. One hour of recitation and four hours of drafting, or six hours of drafting. First semester. Elective for students who have credit for Mechanical Drawing 4, and have credit for or are taking 15. *Tu., 11.20 to 1.20; 2.20 to 6.20.*

20. *Bridge Design*

Theory and practice of truss detailing. General and working drawings are prepared for a pin or riveted truss bridge for highway or railway traffic and for a timber or steel roof truss, the work being adapted to the needs of the class. Erection, shop practice, specifications, and other points not covered in 15 are discussed. Lectures, computations, drafting. *Professor* Cross *and Mr.* Bohl.

Three hours. One hour of recitation and four hours of drafting, or six hours of drafting. Second semester. Elective for students who have credit for 15 and 19. *Tu., 11.20 to 1.20; 2.20 to 6.20.*

22. *Masonry Design*

Theory of dams, arches, retaining walls, and similar structures. Special attention given to the theory of reinforced concrete. Properties of concrete. Design of a dam, an arch, and of several reinforced concrete structures. Lectures, recitations, computations, drafting. *Professor* Cross *and Mr.* Bohl.

Five hours. Two hours of recitation and six hours of drafting. Second semester. Elective for students who have credit for 15, and Mechanical Drawing 4. *Mon. at 10.20; Th., 10.20 to 1.20; 2.20 to 6.20.*

24. *Foundations*

Methods employed and results to be expected in foundation work. Special attention given to the more common cases. Lectures and recitations. *Professor* Cross.

One hour. Second semester. Elective for students who have credit for Mechanics 2. *Tu. at 10.20.*

26. *Contracts and Specifications*

Law of contracts. Practical considerations in contracting. Preparation of specifications. Interpretation of contracts. Lectures and recitations. *Professor* Cross.

One hour. Second semester. Required of all candidates for the degree of Bachelor of Science. *Th. at 9.20.*

28. *Engineering Jurisprudence*

The legal and some of the economic problems involved in engineering work. The object is to emphasize the importance of these considerations in the solution of technical problems and to interest the student in further investigation. Lectures and recitations. *Professor* Cross.

One hour. Second semester. Elective for Juniors and Seniors. *Wed. at 9.20.*

30. *Hydraulic Engineering* ‡

Consideration of water supply mainly from an engineering standpoint. Irrigation, pumps and pumping machinery; construction of dams and reservoirs. Lectures, recitations, and seminary work. Supplements Mechanics 3, which gives the theoretical treatment of the subject. *Professor* Hill.

Two hours. Second semester. Elective for students who have credit for Mechanics 3. *Mon., Wed., at 10.20.*

32. *Sanitary Engineering* ‡

Theory of sewerage, treatment and disposal of sewage; stream pollution; house drainage and its appliances; garbage collection and disposal; design of sanitary works. Lectures, recitations, drafting, and seminary work. *Professor* Hill.

Three hours. Second semester. Elective for students who have credit for Mechanics 3. *Wed., Fri., at 9.20; Mon., 3.20 to 6.00.*

34. *Hydraulic Surveying* (*Applied Hydraulics*)

Methods of surveying applicable to river and harbor work. Methods of measuring and rating the flow of streams. Actual measurement of the discharge of a stream by means of the current meter, weir, and floats. Recitations and field work. *Mr.* Bohl.

One hour. Three hours of recitation or eight hours of field work last third of second semester. Elective for students who have credit for 2 and Mechanics 3. *Mon., Wed., Fri., at 11.20; or Tu., 9.20 to 5.20.*

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‡ Courses 13, 30, and 32 cover the general subject of sanitation.

35, 36. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Civil Engineering. The thesis must embody either a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

For Students entering in 1914 or after

2, 1,[‡] 3, 5. *Surveying*

Theory and practice of plane surveying; use of tape, compass, level, and transit; adjustment of instruments; pen topography; contour drawing; conventional signs; plotting. *Professor* HILL, *Mr.* BOHL, *and* Assistants.

Three, two (two weeks of field work), two, and three hours. Second semester, summer vacation, first, and first semesters. Elective for students who have credit for Mathematics 17 and Mechanical Drawing 1. 2 and 1 may not be elected separately. Second semester, *Tu., Th., Fri., at 2.20.*

4. *Surveying, Advanced Field Work*

Use of stadia, plane table, and barometer; precise base-line measurement with steel tape; triangulation; topography. *Professors* HILL *and* CROSS, *Mr.* BOHL, *and* Assistants.

One hour. Spring recess. Elective for students who have credit for 1, 2, 3, and 5.

6, 7, 16. *Railroad Engineering*

Theory, location, construction, and economics of railroad engineering. Lectures, recitations, field work, and drafting. Second semester, railroad curves and practical problems. First semester, actual location of a line about two miles long, map, and estimate of cost. Second semester, railroad track and track work; maintenance of way department; economics of location; earthwork and its cost; rock excavation; tunneling. *Professors* HILL *and* CROSS, *Mr.* BOHL.

Three, three (six hours of field work) and three hours. Second, first, and second semester. Courses 6 and 7 are elective for students who have credit for 5. Course 16 is elective for Juniors and Seniors.

10. *Geodesy.*

Problems in geodetic surveying, with sufficient theory for a proper

understanding of the formulas used. Lectures, recitations, and computations. *Professor* Hill.

[‡] Civil Engineering 1 is taken in September during the two weeks preceding the opening of college.

Two hours. One hour of recitation and two hours of computations. Second semester. Elective for students who have credit for 4, and Astronomy 5.

12. *Highway Engineering*

Economics and location of country roads; surveys, grades, drainage, and foundations; construction and maintenance; economics and design of pavements; dust prevention and preservation of macadam roads; use of bituminous materials in the construction and maintenance of roads; methods of testing road materials; roads and pavements in foreign countries; systems of administration and maintenance; highway laws. Lectures, recitations, inspection trips, and seminary work. *Mr.* Bohl.

Three hours. Second semester. Elective for Sophomores, Juniors, and Seniors.

14. *Elements of Structures*

Reactions, shears, moments, stresses in beams, simple trusses, and girders. The course aims to cover thoroughly the fundamental principles of simple structural design, and the essentials of routine structural work. Practice in reading and preparing structural drawings. *Professor* Cross.

Three hours. Second semester. Elective for students who have credit for Mechanics 1.

18. *Surveying*

A condensation of 2, 1, 3, 5 designed to give electrical and mechanical engineering students the fundamental principles in regard to the use of the tape, transit, and level. *Professor* Hill, *Mr.* Bohl, *and* Assistants.

One hour. Second semester. Not elective.

26. *Engineering Law and Practice*

Contracts and contracting, business law and relations in general, riparian law, patents, cost systems, organization and management, and kindred topics. The course aims to outline the broader professional activities of the engineer and to indicate his relations to the public and to other professional men. Some of the lectures are optional for certain classes of students, and opportunity is afforded for specialization. *Professors* Kenerson, Brooks, Cross, *and* special lecturers.

One hour. Two hours of attendance. Second semester. Elective for Juniors and Seniors.

34. *Hydraulic Surveying* (*Applied Hydraulics*)

Methods of surveying applicable to river and harbor work. Methods of measuring and rating the flow of streams. Actual measurement of the discharge of a stream by means of the current meter, weir, and floats. Recitations and field work. *Mr.* BOHL.

One hour. Three hours of recitation or eight hours of field work last third of second semester. Elective for students who have credit for 5, and Mechanics 3.

36. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Civil Engineering unless a substitute is allowed by the head of the department. The thesis must embody either a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

37, 38. *Theory of Structures*

Extends the work of 14; the essentials of design in steel, masonry, and timber; both substructure and superstructure are included. While the work is primarily theoretical, practice and its relations to theory are emphasized. In the second semester special attention is given to reinforced concrete. *Professor* CROSS.

Three hours. Through the year. Elective for students who have credit for 14.

40. *Structural Design*

Design of foundations, buildings, bridges, dams, arches, retaining walls, and similar structures. Preparation and study of strain sheets and working drawings. Individual problems are given and results are from time to time discussed by the class. *Professor* CROSS *and Mr.* BOHL.

Three hours. Six hours of drafting. Second semester. Elective for students who have credit for or are taking 38.

42. *Advanced Structural Design*

Supplements courses listed above by giving the student a knowledge of important literature, and of principles and methods not readily acquired in practice. Discussion of special problems in advanced branches of the science. *Professor* CROSS.

Three hours. Six hours of attendance. Second semester. Elective for students who have credit for or are taking 38 and 40.

43, 44. *Construction in Steel and Concrete*

Primarily for those who will become purchasers rather than designers of engineering structures. Principles and methods of design are explained and the whole process of construction outlined from foundation to completed structure, the functions of each worker from laborer to purchaser being indicated. Practice in reading and preparing structural drawings. *Professor* CROSS.

Three hours. Through the year. Elective for those who have credit for Mechanics 1.

45, 46. *Water Supply and Sewerage*

Water supply and sewerage from a sanitary and an engineering standpoint. The first semester is devoted mainly to the chemical, biological, and descriptive aspects of the subjects, and the second semester to engineering construction and design. *Professor* HILL.

Four hours and three hours. Through the year. 45 is elective for seniors. 46 is elective for students who have credit for Mechanics 3, and Civil Engineering 14.

VIII. ECONOMICS ‡

HENRY BRAYTON GARDNER, PH.D., *Professor of Economics*
JAMES MARVIN MOTLEY, PH.D., *Associate Professor of Economics*

1. *Elementary Economics*

An outline and discussion of the fundamental principles of the subject. *Professors* GARDNER *and* MOTLEY.

Three hours. In connection with Social Science 1, or Political Science 1, constitutes a year course required in Sophomore, Junior, or Senior year of candidates for the degree of Bachelor of Arts or Bachelor of Philosophy, and in Sophomore year of candidates for the degree of Bachelor of Science. The combined courses will be given in two sections. For the first section Economics will be given in the first semester and Political Science in the second semester. *Tu., Fri., Sat., at 10.20.* For the second section Social Science will be given in the first semester and Economics in the second semester. *Mon., Wed., Fri., at 12.20.* Students must indicate their choice of section on the registration card.

5, 6. *Money and Banking*

Principles of money; recent monetary history, particularly of the United States; systems of the leading industrial nations; present

‡ The courses in this department other than 1 are open only to students who have credit for Economics 1, and Social Science 1, or Political Science 2.

problems. Principles of banking; recent banking history, particularly of the United States; systems of the leading industrial nations; present problems, with special reference to the problem of the reform of the banking system in the United States. *Professor* GARDNER.

Three hours. Through the year. *Wed., Fri., Sat., at 11.20.*

7. *Problems of Labor and Industry*

An analysis of the economic and social effects of modern methods of production; the rise of the trade union and the influence of collective bargaining; the organization of industry; scientific management, profit sharing, legal minimum wage, social insurance, and other modern movements to secure industrial efficiency and a more equitable distribution of wealth. *Professor* MOTLEY.

Three hours. First semester. *Mon., Tu., Th., at 11.20.*

8. *Socialism and Allied Movements*

Criticism of the present industrial order; brief review of the historically important socialistic schemes; an analysis and criticism of the leading socialistic theories with special reference to present-day proposals; communism, syndicalism, and land nationalization as agencies for economic reform. *Professor* MOTLEY.

Three hours. Second semester. *Mon., Tu., Th., at 11.20.*

[10. *Tariff, Reciprocity, and Shipping Subsidies*]

The development of the American system of protection and its effect upon domestic industry and international commerce; an analysis and criticism of arguments for protective tariff and for free trade; reciprocity agreements; policies of leading nations with regard to state aid to shipping.

Three hours. Second semester. Not offered in 1914–15.

11, 12. *Public Finance and Financial History*

General principles of public finance; revenues and expenditures of leading industrial nations; public enterprises in their financial aspects; principal forms of taxation and their effects; public debts. Special attention will be given to the financial history of the United States from the adoption of the Constitution to the present day. *Professor* GARDNER.

Three hours. Through the year. *Tu., Th., Sat., at 12.20.*

13. *Statistics*

The principles of statistics as a method of recording and presenting social and economic facts; the possibilities and limitations of the statistical method; the interpretation of statistics; some of the important results of statistical investigation.

Three hours. Two hours of attendance. First semester. *Fri., 3.20 to 5.20.*

14. *Accounting*

The importance of accounting in economic life and the principles which underlie it; the accounting systems of public bodies and quasi-public corporations; the interpretation of financial statements.

Three hours. Two hours of attendance. Second semester. *Fri., 3.20 to 5.20.*

15. *Trade and Transportation*

The organization of international trade and the place of the United States in the commerce of the world; a description of the existing trade relations of the United States, of the conditions which control them, and the probable lines of their development, the organization and development of the internal trade of the United States with special reference to railway transportation and the problems to which it has given rise. *Professor* MOTLEY.

Three hours. First semester. *Mon., Wed., Th., at 10.20.*

16. *Corporations and Corporation Finance*

The corporation as a form of business organization; its formation and promotion; capitalization; forms of securities; the stock market; state and federal control and similar topics. *Professor* MOTLEY.

Three hours. Second semester. *Mon., Wed., Th., at 10.20.*

21, 22. *Investigation of Special Topics*

Intended to afford a training in methods of gathering, handling, and presenting data in the study of economic life and problems. Each student is assigned a separate topic. *Professors* GARDNER *and* MOTLEY.

Three hours. Six hours of attendance. Through the year. Either semester may be elected independently. Students intending to take either of these courses must secure the permission of the head of the department not later than December 1 or June 1 in the semester preceding that in which they desire to take the course. It is expected that as a rule these courses will be taken in connection with lecture courses. Hours to be arranged with the instructor.

23, 24. *Economic Seminary*

Study of important aspects of economic theory, history, and current problems of economic life. *Professors* GARDNER *and* MOTLEY.

Three hours. Two hours of attendance. Through the year. Elective for Seniors and Graduates who have taken advanced work in Economics. Hours to be arranged with the instructor.

IX. EDUCATION‡

WALTER BALLOU JACOBS, A.M., *Professor of Education*

STEPHEN SHELDON COLVIN, PH.D., *Professor of Educational Psychology*

2. *Principles of Education*

The meaning and scope of education; its function as a social institution; physical education—heredity and instinct, growth and development, adolescence, the function of play and athletics, fatigue; intellectual education—its aim, the origin and growth of mental activities, the acquisition, reproduction, elaboration of knowledge, the truth and fallacy of mental discipline, the choice of studies and their organization, the principles of method; education and behavior—habit formation, the development of character. The course is an introduction to the study of education. At the same time it will be of service to those who desire a brief survey of the principles and problems of education. *Professor* JACOBS.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates, and by permission. *Mon., Wed., Fri., at 12.20.*

1. *History of Education*

Education among the early culture peoples; development of education in Greece and Rome; early Christian education; the Renaissance and humanism; the beginnings of modern education; the naturalistic movement, Rousseau; the psychological movement, Pestalozzi, Froebel, Herbart; the scientific movement, Spencer and Huxley; education in the United States; recent sociological tendencies; the movement for industrial education. The emphasis will be on the modern period. *Professor* Jacobs.

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‡ Courses 1 and 2 are general and cultural in character; interest in them is therefore not limited to those who intend to teach. At the same time they form an introduction to the more advanced courses in Education. Those who intend to teach are advised to elect these courses during the Junior year.

Courses 1-4 cover the usual requirements for certificates of the First Grade except where practice teaching or experience is demanded. In Rhode Island a certificate is required of all teachers in schools supported in whole or in part by public money. Certificates of the First Grade are granted without examination to those who have completed courses 1-4 and hold a college degree. Due credit is also given for separate courses.

Certificates, authorizing the holders to teach in the evening schools of the state, are issued without examination to students who have completed three years of regular work, including Education 1, 2.

For further explanation of the work of this department, see the Catalogue, page 158.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates, and by permission. *Mon., Wed., Fri., at 12.20.*

3. *Psychology of Education*

A study of the general principles of learning and a discussion of habit formation, and of the various activities of mind involved in the process of education, — sensation and perception, imagination, association and memory, attention and interest, the higher mental processes. The course also discusses the problem of transfer in training; work and play; fatigue; economical methods of learning; tests of mental capabilities. *Professor* Colvin.

Three hours. First semester. Elective for students who have credit for 1 or 2, or are taking 2, and for Graduates. *Mon., Tu., Th., at 11.20.*

4. *Practical Introduction to Teaching*

The elements of method and their application in practice teaching; observation of good teaching; management and discipline of classes; school law. *Professor* Colvin.

Three hours. Second semester. Elective for students who have credit for or are taking other courses in Education, and for Graduates. *Mon., Tu., Th., at 11.20.*

5. *Secondary Education;*‡ *Organization and Function*

The place of the high school and academy in the American system of education; comparison with secondary schools in Germany, France, and England; the administration of secondary education; its relation to the colleges and universities; meaning and value of the various secondary school studies, and their organization into a curriculum; high schools; the social life of the high school and academy; high school extension. *Professor* Jacobs.

Three hours. Two hours of attendance. First semester. Elective for Graduates and experienced teachers, and for approved Seniors. *Wed., 3.20 to 5.20.*

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‡ In the courses in Secondary Education, Professor Jacobs will be assisted by the following Lecturers on Method:

Charles Edward Dennis, Ph.D., *Latin.*
Jesse Madison Gathany, A.M., *History.*
Ernest Cobb, Ph.B., *English.*
Richard Owen Dummer, A.M., *Physics and Chemistry.*

6. *Secondary Education;*‡ *Methods and Processes*

The principles of method as applied to teaching in secondary schools; the resources at the command of the teacher; the preparation of teachers. The following will receive special attention as typical secondary school studies: English, Modern Languages, and Latin; History, Science, and Mathematics; the Manual Arts. *Professor* JACOBS.

Three hours. Two hours of attendance. Second semester. Elective for Graduates and experienced teachers, and for approved Seniors. *Wed., 3.20 to 5.20.*

7, 8. *Problems in Practical Teaching; Secondary Schools*

Practice teaching in the Providence High Schools. Observation, reports, and conferences. Designed for those who wish to become instructors in colleges, teachers or principals in secondary schools, or superintendents of schools. *Professor* COLVIN, *assisted by the* Supervising Teachers.

Three hours. Through the year. Elective for Graduates who have credit for elementary courses in Education and are taking 5, 6 and 15, 16, and for approved Seniors. *Sat. at 9.05*, and at other hours to be arranged.

9, 10. *Problems in Practical Teaching; Grammar Grades*

Practice teaching in the Providence Grammar Schools. Observation, reports, and conferences. Designed especially for those who wish to become grade teachers, principals of grammar schools, or superintendents of schools, but also for those who wish to teach in secondary schools. The following studies receive special attention: Arithmetic, Language, History, and Geography. *Professor* COLVIN, *assisted by the* Supervising Teachers.

Three hours. Through the year. Elective for Graduates who have credit for elementary courses in Education and are taking 15, 16, and for approved Seniors. *Mon. at 3.20*, and at other hours to be arranged.

11, 12. *Experimental Education*

A laboratory course in educational psychology. The principal methods which have been used in measuring mental and physical capabilities will be reviewed and discussed. Under guidance the student will work through a number of the most important of these methods in the laboratory. He will also conduct a specific experiment in some phase of experimental education, report on his results from time to time, and finally set these forth in the form of a thesis. *Professor* Colvin.

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‡ In the courses in Secondary Education, Professor Jacobs will be assisted by the following Lecturers on Method:

CHARLES EDWARD DENNIS, PH.D., *Latin.*
JESSE MADISON GATHANY, A.M., *History.*
ERNEST COBB, PH.B., *English.*
RICHARD OWEN DUMMER, A.M., *Physics and Chemistry.*

Three hours. Through the year. Elective for Graduates and experienced teachers.

13, 14. *Educational Administration*

Problems of educational administration in the State of Rhode Island and in the cities and towns of the state. In the study of these problems the varied experiences and experiments of other states and of European countries will be considered. Out of this study will be developed the principles underlying national and municipal administration of education. *Professor* Jacobs.

Three hours. Through the year. Two hours of attendance. Elective for Graduates, experienced teachers, principals, and superintendents, and for approved Seniors. *Th., 4 to 6.*

15, 16. *Seminary in Education*

Studies in current educational problems. The seminary will be conducted in two parts in successive hours. *Part A.* Reviews of the latest books upon education and related subjects, and studies of special problems assigned to individual students for investigation and experiment. *Part B.* A more intensive study of certain problems of current interest. For 1914–15 the subjects will be: First semester, Sociological Phases of Education. Second semester, Recent Educational Theory. As subjects are not repeated, the course may be elected for successive years. *Professor* Jacobs.

Three hours. Through the year. Two hours of attendance. Required of student-teachers. Elective for Graduates and experienced teachers, and for approved Seniors. A or B may be elected independently as a one-hour course. *Sat., 10.20 to 12.20.*

X. ENGLISH‡

Walter Cochrane Bronson, A.M., Litt.D., *Professor of English Literature*

Lindsay Todd Damon, A.B., *Professor of English Literature and Rhetoric*

Albert Knight Potter, A.M., *Associate Professor of the English Language*

George Wyllys Benedict, Ph.D., *Associate Professor of English*

Thomas Crosby, A.M., *Associate Professor of English and Public Speaking*

Henry Barrett Huntington, A.B., *Associate Professor of English*

William Thomson Hastings, A.M., *Assistant Professor of English*

Walter Clarke Phillips, A.M., *Instructor in English*

John Henry Williams, A.B., *Instructor in English*

Benjamin Crocker Clough, A.B., *Assistant in English*

Clarence Edwin Ayres, A.B., *Assistant in English*

————————, *Assistant in English*

1. *Rhetoric and Composition*

Designed primarily to teach clear and correct expression. Training in the fundamentals of prose composition. Lectures, recitations, and themes. *Professors* Damon, Benedict, *and* Hastings, *Messrs.* Phillips, Williams, Clough, Ayres, *and* ——.

Three hours. First semester. Required of all Freshmen. *1st, 2d, and 3d div., Mon., Tu., Th., at 11.20; 4th, 5th, and 6th div., Mon., Wed., Fri., at 12.20; 7th div., Wed., Fri., Sat., at 11.20; 8th div., Mon., Tu., Th., at 3.20.* Candidates for the degree of Bachelor of Science will register in divisions 4 and 5. Students who fail in 1 will be required to repeat the course in the second semester, reciting *Mon., Wed., Fri., at 12.20.*

2. *Rhetoric and Composition*

A continuation of 1. Designed primarily to give training in the method, structure, and style of the chief forms of prose composition. Lectures, recitations, and themes. *Professors* Benedict *and* Hastings, *Messrs.* Phillips, Williams, Clough, Ayres, *and* ——.

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‡ Credit for English 1 or 2 is a prerequisite for admission to all other courses in the department except 48.

Courses 1-16 may not be counted in fulfilment of the requirement of a year in English Literature.

Three hours. Second semester. Required in the Freshman year of all candidates for the degree of Bachelor of Science, and in the Sophomore year of all candidates for the degree of Bachelor of Arts or Bachelor of Philosophy. Students electing 3, 4 may substitute 3 for 2. Students taking 7, 8 instead of Freshman mathematics may omit 2 in their Sophomore year and take 3 in their Junior year, if they obtained at least the grade of C in 1. *1st and 2d div., Mon., Tu., Th., at 11.20; 3d and 4th div., Mon., Wed., Fri., at 12.20; 5th div., Wed., Fri., Sat., at 11.20; 6th div., Mon., Tu., Th., at 3.20.* Freshman candidates for the degree of Bachelor of Science will register in sections 3 and 4.

48. *English Literature from the Beginning to 1700*

An outline course in the history of English literature to the end of the seventeenth century, with reading and study of the greater writers. *Professors* BRONSON, DAMON, *and* HASTINGS.

Three hours. Second semester. Required in the Freshman year of all candidates for the degree of Bachelor of Arts or Bachelor of Philosophy. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Mon., Tu., Th., at 11.20; 3d and 4th div., Mon., Wed., Fri., at 12.20.*

49. *English Literature from 1700 to 1900*

An outline course in the history of English literature of the eighteenth and nineteenth centuries, with reading and study of the greater writers. *Professors* BRONSON *and* DAMON.

Three hours. First semester. Required in the Sophomore year of all candidates for the degree of Bachelor of Arts or Bachelor of Philosophy. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Mon., Wed., Fri., at 12.20; 3d div., Mon., Wed., Th., at 10.20.*

3, 4. *English Composition, Second Course*

Intended to supplement the training given in 1, 2, and to develop further the power of exact and lucid statement. Lectures, recitations, and prescribed reading; weekly themes and other written exercises involving a variety of specific tasks such as abstracts, reports, scientific, technical, and historical papers, criticisms, stories, personal essays, etc. *Professor* HASTINGS.

Three hours. Through the year. Elective for Sophomores and Juniors. Students electing 3, 4 may substitute 3 for 2. *Mon., Wed., Th., at 10.20.*

[5, 6. *English Composition, Advanced Course*]

Intended to develop ease of style and clarity and vigor of thought. Frequent practice in composition and criticism.

Three hours. Through the year. Elective for Juniors and Seniors. With the consent of the instructor the course may be repeated. Not offered in 1914–15.

7, 8. *Argumentative Composition*

Intended to develop the power of handling argumentative topics cogently and persuasively. Lectures on the principles and forms of argumentative composition; frequent practice in brief-drawing and the writing of forensics and less formal arguments. *Professor* HUNTINGTON.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors; required in the Sophomore year of candidates for the degree of Bachelor of Philosophy who did not elect to take mathematics in their Freshman year. *Tu., Fri., Sat., at 10.20.*

9. *Debate*

Intended to train students in correct and vigorous oral presentation of ideas. *Professor* HUNTINGTON, *with the coöperation of the Professors of Economics, Social and Political Science, History, and Public Speaking.*

Three hours. First semester. Elective for a limited number of Juniors and Seniors who have credit for 7. With the consent of the instructor the course may be repeated. *Mon., 3.20 to 5.20; Fri., 2.20 to 4.20.*

11, 12. *Public Speaking*

Principles of voice culture; vocal interpretation of literature; extempore speaking. *Professor* CROSBY.

Three hours. Through the year. Elective for Sophomores and Juniors. *Mon., Tu., Th., at 11.20.*

13, 14. *Public Speaking, Advanced Course*

Practice in reading lyric, narrative, and dramatic literature, in extempore speaking, and in the composition and delivery of the common forms of the occasional address. Special attention to securing right tone-production and to improvement in speech. *Professor* CROSBY.

Three hours. Through the year. Elective for students who have attained at least the grade of B in 11, 12. *Tu., Th., Sat., at 12.20.* Not to be offered in 1915–16.

15, 16. *Old English*

Essentials of Anglo-Saxon grammar; prose selections; Beowulf. *Professor* POTTER.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 4.20.*

17, 18. *Chaucer*

A study of the poems as literature, with sufficient attention to Middle English grammar to enable the student to read intelligently. Selections from Langland and Gower. *Professor* BENEDICT.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Fri., at 3.20.*

21, 22. *The Drama in England to 1642*

The drama as a literary type and its history in England to the closing of the theatres. *Professor* POTTER.

Three hours. Two hours of attendance. Through the year. Elective for students who have credit for a year's work in English Literature. *Wed., Fri., Sat., at 11.20.* Not to be offered in 1915–16.

[23, 24. *The Modern English Drama*]

The history of the English drama from 1660 to the present time. Reading and discussion of the work of the chief playwrights from Wycherley and Congreve to Jones, Pinero, and Shaw.

Three hours. Through the year. Elective for students who have credit for a year's work in English Literature. Not offered in 1914–15.

[25, 26. *Shakspere*]

Careful study of a few plays with special attention to exact interpretation.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Not offered in 1914–15.

27, 28. *Shakspere*

A brief survey of the drama before Shakspere. Shakspere as playwright and poet. Reading of all the plays; careful study of the great tragedies. Lectures, discussions, and reports on assigned topics. *Professor* POTTER.

Three hours. Through the year. Elective for students who have credit for a year's work in English Literature. *Tu., Th., Sat., at 12.20.*

29. *English Literature, exclusive of the Drama, from 1558 to 1603*

Elizabethan verse and prose in their relation to the great movements of the age, with special attention to Spenser and Bacon. *Professor* BRONSON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. First semester. Elective for students who have credit for a year's work in English Literature. *Mon., Tu., Th., at 11.20.* Not to be offered in 1915–16.

30. *English Literature, exclusive of the Drama, from 1603 to 1660*

Puritanism in literature; the Cavalier lyrists; the great prose writers; all the English poems and the more important prose works of Milton. *Professor* BRONSON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Second semester. Elective for students who have credit for a year's work in English Literature. *Mon., Tu., Th., at 11.20.* Not to be offered in 1915–16.

[31, 32. *English Literature from 1660 to 1798*]

The Restoration drama; the classical school; development of the essay and the novel; the beginnings of romanticism. Dryden, Wycherley, Congreve, Addison, Swift, Defoe, Richardson, Fielding, Pope, Gray, Collins, Smollett, Sterne, Johnson, Goldsmith, Burke, Burns.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for a year's work in English Literature. Not offered in 1914–15.

33, 34. *The English Novel*

The history of the English novel from 1700 to 1900; reading and discussion of the greater English novelists, including Defoe, Richardson, Fielding, and Smollett in the eighteenth century, and Scott, Jane Austen, Dickens, Thackeray, Charlotte Brontë, George Eliot, Meredith, Hardy, and Stevenson in the nineteenth century. *Professor* DAMON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for a year's work in English Literature. *Tu., Fri., Sat., at 10.20.* Not to be offered in 1915–16.

35. *English Literature from 1798 to 1832, Poetry*

The reaction from classicism; the influence of the French Revolution; liberalism and individualism in English poetry; contemporary criticism. Wordsworth, Coleridge, Southey, Scott, Byron, Shelley, Keats, Landor. *Professor* HASTINGS.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. First semester. Elective for students who have credit for a year's work in English Literature. *Mon., Th., Fri., at 9.20.*

36. *English Literature from 1798 to 1832, Prose*

The development of the romantic novel; the rise of the reviews and quarterlies; essays and miscellaneous prose. Scott, Jane Austen, Coleridge, Jeffrey, De Quincey, Lamb, Hazlitt. *Professor* HUNTINGTON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Second semester. Elective for students who have credit for a year's work in English Literature. *Mon., Th., Fri., at 9.20.*

[37. *English Literature from 1832 to 1892, Prose*]

Modifications of romanticism; realism; the influence of science and democracy; tendencies at the end of the century. Essays, history, miscellaneous prose, the novel. Macaulay, Carlyle, Ruskin, Arnold, Pater, Huxley, Dickens, Thackeray, Charlotte Brontë, George Eliot, Hardy.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. First semester. Elective for students who have credit for a year's work in English Literature. Not offered in 1914–15.

38. *English Literature from 1832 to 1892, Poetry*

Modifications of romanticism; Pre-Raphaelitism; the influence of science and democracy; tendencies at the end of the century. Tennyson, Browning, Arnold, Clough, Rossetti, Morris, Swinburne. *Professor* DAMON.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Second semester. Elective for students who have credit for a year's work in English Literature. *Mon., Wed., Th., at 10.20.*

[39, 40. *American Literature*]

American literature from the beginning to 1900, in its relation to American life and to English literature. A rapid survey of the literature of the seventeenth and eighteenth centuries; reading and study of the writers of the nineteenth century, with special attention to Irving, Cooper, Bryant, Poe, Longfellow, Emerson, Hawthorne, Whittier, Holmes, Lowell, and Whitman.

Three hours. Two meetings a week, and a third meeting at the pleasure of the instructor. Through the year. Elective for students who have credit for a year's work in English Literature. Not offered in 1914–15.

[42. *Contemporary English and American Literature*]

A study of the tendencies of modern thought through the literature that reflects it. Reading and discussion of contemporary poets, novelists, and essayists.

Three hours. Second semester. Elective for students who have credit for a year's work in English Literature. Not offered in 1914–15.

43, 44. *Seminary in English Literature*

Studies in medieval story. Reading of a number of metrical romances and ballads; consideration of their sources in myth, legend, folk-tale, and history, and of the relation of the English romances and ballads to those in other languages; comparison with later fiction as regards substance and method. *Professor* BENEDICT.

Three hours. Two hours of attendance. Through the year. Elective for Graduates, and for a limited number of Seniors who have attained at least the grade of C in two years' work in English Literature.

XI. GEOLOGY

CHARLES WILSON BROWN, A.M., *Associate Professor of Geology*
ALFRED CARY HAWKINS, A.M., *Instructor in Geology*

1, 2. *General Geology*

A study of the development of the earth, with special reference to the North American Continent, including a discussion of earth origin, of the work of surface and interior agencies in the production of various topographic forms, rock types and their changes, crustal deformation and continent making, together with a survey of ancient life types and the principles of organic evolution they illustrate. First semester, physiographic and dynamic geology. Second semester, stratigraphy and paleontology.

Three hours. Through the year. Elective for Undergraduates. *Mon., Wed., Th., at 10.20.*

3, 4. *General Geology*

A shorter course than 1, 2, with emphasis upon the discussion of problems that may arise in engineering work. Special attention in map and field study to topographic features resulting from the various geologic agencies, and to the study of hand specimens of ores, minerals, and rock types and their uses. May be continued in 8.

Two hours. Four hours of attendance. Through the year. Required in the Junior year of candidates for the degree of Bachelor of Science in Civil

Engineering. Not elective. First semester, *Mon. at 10.20; Fri. at 9.20.* Second semester, *Mon., Wed., at 10.20.*

5, 6. *The General Geography of North and South America*

A discussion of the physiographic controls that influence the development of transportation and commerce; agriculture, forests, water power, and water supply, such as valleys and rivers, mountains, plains, and other large land features. A study of the laws of meteorology, and the relation of climate to soil products and to man and his development; the location and proper development of cities; and the geographic distribution of ore deposits and other natural resources and their conservation. May be continued in 11, 12.

Three hours. Through the year. Elective for Undergraduates who have credit for 1 or 3, or who presented Physiography for admission, except Freshmen and Sophomores who are taking another course in the department. *Tu., Wed., Sat., at 9.20.*

7, 14. *Economic Geology*

A discussion of the origin, occurrence, distribution, and production of building and structural materials; of the non-metalliferous and metalliferous ore deposits.

Three hours. Through the year. 7 is elective for Undergraduates who have credit for 1 or 3; 14 for those who have credit for 1 or 3, and 9. *Tu., Wed., Sat., at 9.20.*

[9, 10. *Mineralogy and Petrography*]

An introductory course in the macroscopic and microscopic study of minerals, ores, and rocks. First semester, discussion of crystal forms and the laws of crystallography, determination by physical properties and blow-pipe analysis of the more common minerals and ores. Second semester, study of the optical properties of the rock-forming minerals, rocks, and ores, under the polarizing microscope; determination of rock types; discussion of the fundamental principles of the origin and classification of rocks and ores.

Three hours. Six hours of attendance. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Th., at 11.20.* Not offered in 1914–15.

11, 12. *Research in Geology and Geography*

Advanced work in the library, laboratory, or field, in the various phases of geology or geography. The region in which the University is situated offers in a small compass both simple and complex problems in field research in structural, petrographic, mineralogic, paleontologic, and stratigraphic geology. Arranged to meet the requirements of individual students.

One to six hours. Through the year. Elective for Graduates and approved Undergraduates. Either semester may be elected independently.

[13. *Dynamic and Stratigraphical Geology*]

Detailed study of the origin and development of North America and the recognition of the index fossils of the different systems, especially of the Narragansett Bay region.

Three hours. Two hours of attendance. First semester. Elective for Juniors, Seniors, and Graduates who have credit for Geology 1, 2, or their equivalents. Alternates with 7. Not offered in 1914–15.

[8. *Stratigraphy and Structural Geology*]

An introductory course in field geology. Study of areal and structural geology in igneous and sedimentary areas from geologic reports. Practice in the construction of geologic maps and work in the field areas.

Three hours. Second semester. One conference hour to be arranged, and five hours' work in the laboratory or field. Elective for Undergraduates who have credit for 1 or 3. Not offered in 1914–15.

15. *Typographic Geology*

Includes the recognition and surveying of typical land features and the construction in the laboratory of a model of an assigned topographic form.

Three hours. Six hours of attendance. First semester.

XII. GERMANIC LANGUAGES AND LITERATURES ‡

Camillo von Klenze, Ph.D., *Professor of the Germanic Languages and Literatures*

Asa Clinton Crowell, Ph.D.,† *Associate Professor of the Germanic Languages and Literatures*

Robert McBurney Mitchell, A.B., *Instructor in German*

Albert Edward Rand, Ph.D., *Instructor in German*

Bernard Keenan, A.M., *Instructor in German*

1, 2. *Elementary Course, First Year*

Reading, grammar, composition, conversation, dictation, sight reading. *Messrs.* Mitchell, Rand, *and* Keenan.

Three hours. Through the year. Elective for students who did not present German for admission. *1st div., Tu., Wed., Sat., at 9.20; 2d div., Tu., Th., Sat., at 12.20; 3d div., Mon., Th., Fri., at 9.20.*

3, 4. *Elementary Course, Second Year*

Reading of fairly difficult modern German stories, lyrics (von Klenze or Hatfield), and two dramas illustrating respectively the classical and the modern period, for example, Schiller's *Maria Stuart* and Hebbel's *Agnes Bernauer*. Review of grammar; composition; conversation based upon the texts read. *Mr.* Keenan.

Three hours. Through the year. Elective for students who have credit for 1, 2, or who presented elementary German (1 year) for admission. *Tu., Wed., Sat., at 9.20.*

5, 6. *Intermediate Course*

Reading of fairly difficult modern German stories, lyrics (von Klenze or Hatfield), and one or two dramas of the classical period. Review of grammar; composition; conversation based upon the texts read. *Messrs.* Mitchell *and* Rand.

Three hours. Through the year. Elective for students who have credit for 3, 4, or who presented elementary German (2 years) for admission. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Tu., Fri., Sat., at 10.20; 3d div., Mon., Wed., Th., at 10.20.*

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‡ Students wishing recommendations from the department to teach German must pass a special examination designed to test their ability to write and to understand German, and, to some extent, to use the spoken language.

† On leave of absence during the academic year 1914–15.

7, 8. *Advanced Course in Standard Authors, Classical and Modern*

One drama of Goethe or Schiller, one drama of Grillparzer, one drama of Hebbel, von Klenze's *Deutsche Gedichte,* a modern novel like Sudermann's *Frau Sorge.* Talks in German on the history of German literature; oral and written reports in German. *Messrs.* RAND *and* KEENAN.

Three hours. Through the year. Elective for students who have credit for 5, 6, or who have passed 3, 4, with grade B; or who presented intermediate German for admission. *1st div., Mon., Tu., Th., at 11.20; 2d div., Tu., Th., Sat., at 8.*

9, 10. *Modern Prose*

Aims to train the student in reading, speaking, writing, and understanding modern German. Reading of texts selected from history and science; for example, Freytag, Helmholtz, Nichols's *Modern German Prose,* Paszkowski's *Lesebuch zur Einführung in die Kenntnis Deutschlands und seines geistigen Lebens,* 5th ed., and a text (such as Mosher's *Willkommen in Deutschland*) to introduce the student to the actual language of modern daily life. Talks in German; oral and written reports in German; letter-writing, composition, and conversation. *Professor* VON KLENZE *and Mr.* MITCHELL.

Three hours. Through the year. Elective for students who have credit for 5, 6, or who have passed 3, 4, with grade B; or who presented intermediate German for admission. *1st and 2d div., Tu., Fri., Sat., at 10.20.*

11, 12. *German Lyrical Poetry*

Introduces the student to the various aspects of the life of the German people as reflected in the lyrical poetry of the last two centuries. Lectures in German; oral and written reports in German. *Professor* VON KLENZE.

Three hours. Through the year. Elective for students who have credit for 3, 4, or 7, 8, or 9, 10. *Wed., Fri., Sat., at 11.20.*

[13, 14. *The German Short Story*]

The development of the short story into an art form. The study of the "Novelle" as represented by Kleist, Ludwig, Heyse, Storm, C. F. Meyer, Keller, and others, with frequent reference to the chief writers of the short story in France, England, and America. Lectures and reports in German and English.

Three hours. Through the year. Elective for students who have credit for 3, 4, or 7, 8, or 9, 10. Not offered in 1914–15.

15, 16. *The German Drama of the Nineteenth Century*

Kleist, Grillparzer, Hebbel, Hauptmann, and Sudermann. A study of the development of the German drama from waning romanticism to realism, with frequent reference to the chief representatives of the modern drama in other countries. *Mr.* KEENAN.

Three hours. Through the year. Elective for students who have credit for 3, 4, or 7, 8, or 9, 10. *Tu., Wed. Sat., at 9.20.*

[17, 18. *Lessing and Schiller*]

Aims to introduce the student to the dramatic theory and practice of German classicism. Reading of one or two of Lessing's dramatic works and of several of the representative dramas of Schiller, especially *Wallenstein.* Discussions of the dramatic principles of the Greek and the English drama and of their influence upon Lessing and Schiller, with references to the dramatic theories of the nineteenth century. Lectures and reports in German and English.

Three hours. Through the year. Elective for students who have credit for 7, 8, or 9, 10. Not offered in 1914–15.

[21, 22. *Goethe's Faust: Parts* 1 *and* 2]

Interpretation of the text; study of the Faust legend and of other English and German dramas which present the Faust problem. Lectures and reports.

Three hours. Through the year. Elective for Juniors and Seniors who have credit for 5, 6, and for others by permission. Not offered in 1914–15.

23, 24. *Goethe: A Study of His Life and Works*

Lectures in German; reports on assigned topics; extensive reading. *Professor* VON KLENZE.

Three hours. Through the year. Elective for students who have credit for 7, 8, or 9, 10. *Tu., Th., Sat., at 12.20.*

[25, 26. *Outline History of German Literature*]

Aims to acquaint the student with the most important movements in the evolution of German literary life. Lectures in German; reports on assigned topics; extensive reading.

Three hours. Through the year. Elective for students who have credit for 7, 8, or 9, 10. Not offered in 1914–15.

[27, 28. *German Literature in the Nineteenth Century*]

A study of the literary life of Germany as an expression of German civilization in the nineteenth century. The literary output—Romantic School, Young Germany, Naturalism, Realism, Neo-Romanticism—will be studied, with frequent references to prominent personalities in other domains of intellectual life, such as David Friedrich Strauss, Mommsen, Nietzsche, Wagner. Lectures in German; reports on assigned topics; extensive reading.

Three hours. Through the year. Elective for students who have credit for 7, 8, or 9, 10. Not offered in 1914–15.

31. *Gothic*

The Gothic language, with reading of extracts in Streitberg's *Gotisches Elementarbuch* or Braune's *Gotische Grammatik*. *Dr.* RAND.

Three hours. First semester. Elective for Graduates and approved Undergraduates.

32. *Old High German*

Grammar and reading of selections in prose and verse. Some knowledge of Gothic expected. Braune's *Althochdeutsche Grammatik* and Braune's *Althochdeutsches Lesebuch*. *Dr.* RAND.

Three hours. Second semester. Elective for Graduates and approved Undergraduates.

[33. *Old Norse*]

Grammar and reading of selections. Holthausen's *Altisländisches Elementarbuch;* Wilken's *Prosaische Edda;* Hildebrand's *Aeltere Edda.*

Three hours. First semester. Elective for Graduates and approved Undergraduates. Students electing Old Norse should also take Germanic Mythology. Not offered in 1914–15.

[34. *Germanic Mythology*]

Primitive Germanic religion, customs, and ideas, in their relations to German literature. Mythological elements in German poetry. Discussions based on E. Mogk's *Germanische Mythologie.*

Three hours. Second semester. Elective for Graduates and approved Undergraduates. Not offered in 1914–15.

[35, 36. *Middle High German*]

The language of the Middle High German period, including an introduction to Germanic philology. Michels' *Mittelhochdeutsches Elementarbuch; Das Nibelungenlied, Minnesangs Frühling, Walter von der Vogelweide.* Lectures in German. Outside reading.

Three hours. Through the year. Elective for Graduates and approved Undergraduates. Not offered in 1914–15.

41, 42. *Seminary in German Literature*

Aims to give training in modern methods of investigation and criticism. To be conducted in German. *Professor* von Klenze.

Three hours. Through the year. Elective for Graduates.

XIII. GREEK LITERATURE AND HISTORY

James Irving Manatt, Ph.D., LL.D., *Professor of Greek Literature and History*

Francis Greenleaf Allinson, Ph.D., *David Benedict Professor of Classical Philology*

——————————, *Assistant in Greek*

A, B. *Elementary Course*

Designed to cover as much as possible of the entrance requirements, and thus to enable a student to take 1 in the following year if he completes by private study before the opening of the first semester the requirement in Homer, and before the opening of the second semester the requirement in the *Anabasis*. ——

Three hours. Through the year. Elective for students who did not present elementary and advanced Greek for admission. *Tu., Th., Sat., at 12.20.*

1. *Homer and the Greek Anthology*

Six books of the *Odyssey* in the original, with a general survey of the entire poem. Selections from the Elegiac, Iambic, and Lyric Poets. *Professor* Manatt.

Three hours. First semester. Elective for students who presented elementary and advanced Greek for admission, or who have credit for A, B, and have done the additional work indicated above. *Tu., Th., Sat., at 12.20.*

2. *Plato and Lysias*

Plato: *Apology* and *Crito,* with selections from *Phaedo,* and collateral readings from Xenophon's *Memorabilia* and the *Clouds* of Aristophanes. Lysias: *Orations* vii, xxii, xxiii, xxiv, with collateral reading of Xenophon's *Hellenica,* ii. *Professor* Allinson.

Three hours. Second semester. Elective for students who have credit for 1. *Tu., Th., Sat., at 12.20.*

3. *Lucian and the Dramatic Poets*

Selections from Lucian. Lectures on the Greek drama. The *Oedipus Tyrannus* of Sophocles and collateral reading in the *Prometheus* of Aeschylus. *Professor* ALLINSON.

Three hours. First semester. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

4. *The Historians*

The eighth book of Herodotus, with collateral reading of the *Persians* of Aeschylus and Plutarch's *Themistocles.* The seventh book of Thucydides, with collateral reading of Plutarch's *Pericles* and *Nicias. Professor* MANATT.

Three hours. Second semester. Elective for Sophomores. *Mon., Wed., Th., at 10.20.*

[5. *Epic Poetry*]

The *Iliad,* XVIII-XXIV, with a general study of the poem as a whole. Hesiod: selections from the *Theogony* and the *Works and Days.* Selected Homeric Hymns.

Three hours. First semester. Elective for Juniors and Seniors. Not offered in 1914–15.

[6. *The Drama*]

Menander. Aeschylus: *Seven against Thebes.* Euripides: *Medea.* Aristophanes: *Frogs.*

Three hours. Second semester. Elective for Juniors and Seniors. Not offered in 1914–15.

7. *Lyric and Pastoral Poetry*

Pindar: selected Olympian and Pythian Odes. Bacchylides, V, XVII, XVIII. Theocritus: twelve *Idylls. Professor* MANATT.

Three hours. First semester. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

8. *Plato, Aristotle, and Aeschylus*

Plato: selections from the *Republic.* Aristotle: the *Constitution of Athens.* Aeschylus: the *Agamemnon,* with collateral reading of the rest of the *Oresteia. Professor* ALLINSON.

Three hours. Second semester. Elective for Juniors and Seniors. *Wed., Fri., Sat., at 11.20.*

[9. *The Attic Orators*]

Selected speeches of Isaeus, Aeschines, and Demosthenes.

Three hours. First semester. Elective for Juniors and Seniors. Not offered in 1914–15.

[10. *Lucian and Pausanias*]

Three hours. Second semester. Elective for Juniors and Seniors. Not offered in 1914–15.

12. *Greek Composition*

Professor ALLINSON.

One hour. Second semester. Elective for Sophomores, Juniors, and Seniors.

13, 14. *Modern Greek*

Introduction to the language; readings from living Greek authors and Greek newspapers; conversation. *Professor* MANATT.

One hour. Through the year. Elective for Sophomores, Juniors, and Seniors.

15. *Greek Civilization*

The life of the Greeks from Homer to the second century after Christ, with special study of the political, social, and religious institutions of the classical period as illustrated by the literature, history, and monuments of art. Must be followed in the second semester by Latin 16, Roman Civilization. The two semesters together constitute the course in Classical Civilization. *Professor* ALLINSON.

Three hours. First semester. Required in the Freshman or Sophomore year of all candidates for the degree of Bachelor of Philosophy. Not elective. *1st div., Mon., Th., Fri., at 9.20; 2d div., Mon., Tu., Th., at 11.20.*

15 B. *Greek Civilization*

This course covers the same ground as 15.

Three hours. Second semester. Elective for Juniors and Seniors who have not taken 15. *See* Latin 16 B. *Tu., Fri., Sat., at 10.20.*

17, 18. *Greek Seminary*

First semester, Aristophanes and the Comic Fragments, or Comparative Philology. (*See* Indo-European Philology 4.) *Professor* ALLINSON. Second semester, Pindar: Isthmian and Nemean Odes. *Professor* MANATT.

Three hours. Two hours of attendance. Through the year. Elective for Graduates and approved Seniors.

XIV. HISTORY ‡

William MacDonald, Ph.D., LL.D., *George L. Littlefield Professor of American History*

Theodore Frelinghuysen Collier, Ph.D., *Associate Professor of European History*

1, 2. *Medieval and Modern History of Europe*

A general survey of the history of western Europe from the time of the barbarian invasions to the present. A narrative text-book supplemented by lectures, frequent written tests, written reports and abstracts on assigned reading, and topics for special investigation. *Professor* MacDonald.

Three hours. Through the year. Required of candidates for the degree of Bachelor of Arts in the Sophomore or Junior year, and of candidates for the degree of Bachelor of Philosophy in the Freshman, Sophomore, or Junior year. *Mon., Tu., Th., at 2.20.*

3. *History of Christianity: Early and Medieval Period*

A study of organized Christianity, its origins, establishment, expansion, and the development of its institutions and doctrines, from the Apostolic Age to the eve of the Reformation. Lectures and parallel reading, with frequent assignments in the sources. *Professor* Collier.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. With 4 constitutes a continuous year course in Church history, but each course may be elected independently. *Tu., Th., Sat., at 12.20.*

4. *History of Christianity: From the Reformation to the present*

The Reformation; counter-reformation, reaction, and religious conflict; Puritanism and non-conformity; pietism and evangelicalism; Methodism; missions and expansion; main currents of organized Christianity in the nineteenth century. Method as in 3. *Professor* Collier.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. A continuation of 3, but may be elected independently. *Tu., Th., Sat., at 12.20.*

5. *The French Revolution and the Napoleonic Era*

A survey of the eighteenth century, with particular reference to the causes of the French Revolution, followed by a detailed study of the

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‡ The elective courses in History are regularly open only to students who have credit for 1, 2, but by special permission of the instructor elective courses may be taken by students who are at the same time taking 1, 2.

Revolution, its principles and development, and the rise and overthrow of Napoleon. *Professor* Collier.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates. With 6 constitutes a continuous year course in modern European history, but each course may be elected independently. *Tu., Fri., Sat., at 10.20.*

6. *Europe since 1815*

The reconstruction of Europe after Napoleon; reaction and revolution; political reorganization, and the formation of the present states of Europe; colonial expansion and world-politics ; social development. *Professor* Collier.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. A continuation of 5, by which it should preferably be preceded. *Tu., Fri., Sat., at 10.20.*

7. *English History to 1603*

A general course in the history of England from the Roman occupation to the close of the reign of Elizabeth. Lectures, parallel reading, frequent tests, and regular assignments in the sources, with written or oral reports. *Professor* Collier.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates, and for Sophomores who have credit for 1, 2. *Mon., Tu., Th., at 2.20.*

8. *English History, 1603 to the present*

A study of the eighteenth and nineteenth centuries with particular attention to social and economic development; the diplomatic relations of England with the Continental powers will, for the most part, be taken up in 6. A continuation of 7, following the same method. *Professor* Collier.

Three hours. Second semester. Elective for Sophomores, Juniors, Seniors, and Graduates who have credit for 7, and for others by special permission. *Mon., Tu., Th., at 2.20.*

11, 12. *Seminary in European History*

Intensive study of a limited period or of a special phase of social or political development, with a view to training in historical method and the use of the sources. For 1914–15 the subjects are: First semester, The English village in the eighteenth century; a study in rural economic and social conditions. Second semester, Some phases of English social progress in the nineteenth century. *Professor* Collier.

Three hours. Two hours of attendance. Through the year. Elective for Graduates and approved Juniors and Seniors.

13, 14. *American History*

A general course, covering the whole period from the beginnings of English colonization to the present time. Intended as an introduction to the advanced courses in American history and for students who wish only a general survey of the subject. *Professor* MACDONALD.

Three hours. Through the year. Elective for Sophomores, Juniors, Seniors, and Graduates. Either semester may be elected independently, but 14 should preferably be preceded by 13. *Wed., Fri., Sat., at 11.20.*

15, 16. *Constitutional and Political History of the United States*

An advanced course covering the period from 1783 to the present time. Intended primarily for students who wish to specialize in American history or who expect to study law. *Professor* MACDONALD.

Three hours. Two hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., at 12.20.*

17, 18. *Seminary in American History*

Designed to afford training in historical investigation and practice in the use of sources. The subjects vary from year to year, and are drawn from both the colonial and the constitutional periods. For 1914–15 the subjects are: First semester, The social history of the American colonies in the eighteenth century. Second semester, The beginnings of party government in the United States. *Professor* MACDONALD.

Three hours. One to two hours of attendance. Through the year. Elective for Graduates and approved Seniors. Should be preceded by 13, 14, or 15, 16, or 19, 20, but in exceptional cases may be taken by students who at the same time are taking one of these groups of courses.

[19. *Social History of America to 1787*]

The historical development of political, social, and religious institutions in the colonial and revolutionary periods.

Three hours. Two hours of attendance. First semester. Elective for Juniors, Seniors, and Graduates. Not offered in 1914–15.

[20. *History of the United States since 1860*]

A narrative course dealing especially with legal and constitutional development, party changes, and international relations. Intended primarily for students who wish to specialize in American history or who expect to study law.

Three hours. Two hours of attendance. Second semester. Elective for Juniors, Seniors, and Graduates. Not offered in 1914–15.

XV. INDO-EUROPEAN PHILOLOGY

Francis Greenleaf Allinson, Ph.D., *David Benedict Professor of Classical Philology*

[2. *General Introduction to the Study of Language*]

Outline of the history of language; the Indo-European family. Adapted for students of ancient or modern languages.

Three hours. Second semester. Elective for Undergraduates. Not offered in 1914–15.

4. *Seminary in Comparative Philology*

For advanced students in Greek and Latin or modern languages.

Three hours. Two hours of attendance. First semester. Elective for Graduates and approved Seniors.

5, 6. *Sanskrit, Elementary Course*

Whitney's *Grammar;* Lanman's *Reader;* selections from the *Vedic Hymns.*

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates.

[7, 8. *Sanskrit, Advanced Course*]

Vedic Hymns, and other selections.

One hour. Through the year. Elective for students who have credit for 5, 6. Not offered in 1914–15.

XVI. MATHEMATICS

NATHANIEL FRENCH DAVIS, A.M., LL.D., *Professor of Pure Mathematics*

HENRY PARKER MANNING, PH.D., *Associate Professor of Pure Mathematics*

ROLAND GEORGE DWIGHT RICHARDSON, PH.D., *Associate Professor of Pure Mathematics*

RAYMOND CLARE ARCHIBALD, PH.D., *Assistant Professor of Pure Mathematics*

CLINTON HARVEY CURRIER, A.M., *Instructor in Mathematics*

INTRODUCTORY STATEMENT ‡

For students who presented only Algebra and Plane Geometry for admission. Candidates for the degree of Bachelor of Arts, and candidates for the degree of Bachelor of Philosophy who do not intend to take Argumentation in the Sophomore year, are required to take one of the following combinations of courses: (A) 2, 1; (B) 2, 3. Students who intend to specialize in Mathematics are advised to take both 1 and 3 the second semester, or 13, 16 and 17, 18; but if only three hours can be taken in the Freshman year, it is advisable to elect 3 in the second semester.

For students who presented Solid Geometry and Plane Trigonometry for admission. Candidates for the degree of Bachelor of Arts, and those candidates for the degree of Bachelor of Philosophy who do not elect to take Argumentation in the Sophomore year, are required to take one of the following combinations of courses: (A) 5, 6; (B) 5, 3. Students who intend to specialize in Mathematics are advised to take both 3 and 6 in the second semester; but if only one course can be taken, it is advisable to elect 6.

For students who presented Solid Geometry and Advanced Algebra for

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‡ Students wishing to specialize in Mathematics should take the undergraduate courses in the order 2, 3, 5, 6, 7, 8, 9. Courses 1, 16, together with as many of courses 21-44 as possible, should be taken as opportunity offers in connection with the other courses.

It is recommended that students who contemplate teaching in the secondary schools elect courses 1-8, 41, 42, 43, 44.

Courses 13, 16, 17, 18, 19, 20, 9, are primarily for candidates for the degree of Bachelor of Science.

Courses 21-40 are designed primarily for Graduates. Two or three of these courses are offered each year according to the needs of students. For those who have taken all of them, other courses can usually be arranged.

Unless elected by three students, courses 21-44 may not be given.

admission. Candidates for the degree of Bachelor of Arts, and those candidates for the degree of Bachelor of Philosophy who do not elect to take Argumentation in the Sophomore year, are required to take either 2, 18 or 2, 16. Students who intend to specialize in Mathematics are advised to take both 18 and 16 in the second semester.

For students who presented Plane Trigonometry and Advanced Algebra for admission. Candidates for the degree of Bachelor of Arts, and those candidates for the degree of Bachelor of Philosophy who do not elect to take Argumentation in the Sophomore year, are required to take either 5, 6 or 5, 1. Students who intend to specialize in Mathematics are advised to take both 6 and 1 in the second semester; but if only one course can be taken, it is advisable to take 6.

2. *Plane Trigonometry*

Professors DAVIS, MANNING, *and* ARCHIBALD, *Mr.* CURRIER.

Three hours. First semester. Required as noted in Introductory Statement. Elective for other Undergraduates who did not present Plane Trigonometry for admission. *One division, Mon., Wed., Fri., at 8; one division, Mon., Th., Fri., at 9.20; four divisions, Tu., Wed., Sat., at 9.20.*

1. *Solid and Spherical Geometry*

Professors MANNING *and* ARCHIBALD, *Mr.* CURRIER.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for other Undergraduates who did not present Solid Geometry for admission. *One division, Mon., Wed., Fri., at 8; one division, Mon., Th., Fri., at 9.20; two divisions, Tu., Wed., Sat., at 9.20.*

3. *Algebra*

Professors DAVIS *and* ARCHIBALD.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for other Undergraduates. *Two divisions, Tu., Wed., Sat., at 9.20.*

[4. *Algebra*]

Not offered in 1914–15.

5. *Plane Analytic Geometry*

Professor DAVIS.

Three hours. First semester. Required as noted in Introductory Statement. Elective for students who have credit for Plane Trigonometry. *Mon., Th., Fri., at 9.20.*

6. *Analytic Geometry and Differential Calculus*

Professor RICHARDSON.

Three hours. Second semester. Required as noted in Introductory Statement. Elective for students who have credit for 5. *Mon., Th., Fri., at 9.20.*

7, 8. *Differential and Integral Calculus*

A continuation of 6. *Professor* ARCHIBALD.

Three hours. Through the year. Elective for students who have credit for 6. *Tu., Th., Sat., at 12.20.*

9. *Differential Equations*

Professor MANNING.

Two hours. First semester. Required of candidates for the degree of Bachelor of Science in Electrical Engineering. Elective for students who have credit for 8 or 20. *Tu., Th., at 12.20.*

[12. *Modern Analytic Geometry*]

Three hours. Second semester. Elective for students who have credit for 5. Not offered in 1914–15.

13. *Algebra*

Professors MANNING *and* RICHARDSON.

Three hours. First semester. Required of candidates for the degree of Bachelor of Science. *Three divisions, Wed., Fri., Sat., at 11.20; one division, Mon., Tu., Th., at 11.20.*

16. *Spherical Trigonometry*

Professors MANNING *and* RICHARDSON.

One hour. Second semester. Required of candidates for the degree of Bachelor of Science. Elective for students who have credit for Plane Trigonometry, and have not taken Spherical Trigonometry in college. *One division, Th. at 11.20; two divisions, Sat. at 11.20.*

17. *Plane Trigonometry*

Professors DAVIS, RICHARDSON, *and* ARCHIBALD.

Three hours. First semester. Required of candidates for the degree of Bachelor of Science. *Three divisions, Mon., Tu., Th., at 11.20; one division, Wed., Fri., Sat., at 11.20.*

18. *Analytic Geometry*

Professors DAVIS *and* MANNING.

Five hours. Second semester. Required of candidates for the degree of Bachelor of Science. *Two divisions, Mon., Tu., Wed., Th., Fri., at 11.20; one division, Mon., Tu., Wed., Fri., Sat., at 11.20.*

19, 20. *Differential and Integral Calculus*

Professors Davis *and* Richardson.

Four hours. Through the year. Required of candidates for the degree of Bachelor of Science. *One division, Tu., Wed., Sat., at 9.20, Th. at 8; one division, Tu., Fri., Sat., at 10.20, Wed. at 8.*

[21, 22. *Function Theory of a Complex Variable*]

Three hours. Through the year. Elective for Graduates and approved Juniors and Seniors. Not offered in 1914–15.

23, 24. *Differential Equations, Advanced Course*

Professor Manning.

Three hours. Through the year. Elective for those who have credit for 21, 22.

25, 26. *Advanced Algebra*

Among the subjects discussed are the following: linear dependence; systems of linear equations; linear transformations; algebraic invariants; bilinear and quadratic forms; factoring of polynomials in one and in several variables. *Professor* Richardson.

Three hours. Through the year. Elective by special permission of the instructor. *Mon., Wed., Fri., at 8.*

27, 28. *Projective Geometry*

Introductory course with synthetic and analytic treatment of projective forms of one, two, and three dimensions. Some of the main topics are duality, involution, trilinear and tetrahedral coördinates, sphero-conics, skew cubic and quartic curves. *Professor* Archibald.

Three hours. Through the year. Elective for Graduates and approved Undergraduates.

[29, 30. *Function Theory of a Real Variable*]

The foundations of the differential calculus; definite integrals; line integrals; multiple integrals.

Three hours. Through the year. Elective for students who have credit for 25, 26, and for others by special permission. Not offered in 1914–15.

[31, 32. *Applications of Calculus to Geometry*]

Three hours. Through the year. Elective for students who have credit for 8 or 20. Not offered in 1914–15.

[39, 40. *Course in Advanced Topics*]

Among the topics to be discussed are: quadratic forms with a finite number and with infinite many invariables; elementary divisors; linear equations in an infinite number of unknowns; integral equations; boundary value problems in ordinary differential equations.

Amount of credit to be arranged. Elective for Graduates who have adequate preparation. Not offered in 1914–15.

[41, 42. *Fundamental Problems of Algebra*]

An introduction to some of the concepts of modern analysis; designed for students who expect to teach as well as for those who are preparing for advanced work in Mathematics. Among the topics to be treated are: the number system; limits; infinite series; the fundamental operations; determinants and systems of linear equations.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Not offered in 1914–15.

43, 44. *Foundations, Methods, and Problems of Geometry*

Designed for those who expect to teach Mathematics. The main topics of the course will be: foundations; Euclid and his modern rivals; American, French, German, and Italian texts; methods for attacking Euclidean problems; geometrography; famous problems and transcendence of π; history. *Professor* ARCHIBALD.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Tu., Th., Sat., at 8.*

XVII. MECHANICAL ENGINEERING‡

William Herbert Kenerson, M.E., A.M., *Professor of Mechanical Engineering*

James Alexander Hall, A.B., Sc.B., *Instructor in Mechanical Engineering*

Thomas Clark Shedd, Sc.B., *Assistant in Mechanical Engineering*

Henry Dewees Cady, *Instructor in Shop Practice*

1. *Wood-work*

Exercises in carpentry and wood-turning. Assigned reading and written reports. *Mr.* Cady.

Two hours. Five hours of attendance. First semester, *Tu., 2 to 5; Fri., 2 to 4.*

2. *Wood-work*

Exercises in pattern-making. Assigned reading and written reports. *Mr.* Cady.

Two hours. Five hours of attendance. Second semester, *Mon., Th., 2 to 4; Wed. at 11.20.*

3, 4. *Metal-work*

Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. Assigned reading and written reports. *Mr.* Cady.

Two hours. Five hours of attendance. Through the year. First semester, *Mon. at 10.20; Tu., Fri., 2 to 4.* Second semester, *Wed., 2 to 4; Fri., 2 to 5.*

5. *Metal-work*

Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. Assigned reading and written reports. *Mr.* Cady.

Three hours. Seven hours of attendance. First semester, *Tu., Fri., 2 to 5; Fri. at 9.20.*

6. *Wood-work*

Exercises in carpentry, wood-turning, and pattern-making. *Mr.* Cady.

Three hours. Seven hours of attendance. Elective in either semester for Sophomores, Juniors, and Seniors who have had instruction in drawing. First semester, *Tu., Fri., 2 to 5.* Second semester, *Mon., Th., 2 to 5.*

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‡ All the courses in this department except 6 and 7 are required of candidates for the degree of Bachelor of Science in Mechanical Engineering, and, with the exception of 1-5, are elective for other students.

7. *Metal-work*

Exercises in chipping and filing; the use of machine tools; forging and hardening tools, etc. *Mr.* CADY.

Three hours. Seven hours of attendance. Elective in either semester for Sophomores, Juniors, and Seniors who have had instruction in drawing. First semester, *Tu., Fri., 2 to 5.* Second semester, *Mon., Th., 2 to 5.*

8. *Machine Drawing and Kinematics*

Representation of machine parts. Velocity ratios, rolling surfaces, cams, and belting. Recitations, drawing, and the solution of problems. *Mr.* HALL.

Three hours. Seven hours of attendance. Second semester. Elective for students who have credit for Mechanical Drawing 3. *Tu. at 12.20 and 2.20 to 5.20; Fri., 2.20 to 5.20.*

9, 10. *Kinematics, continued*

Gearing, linkwork, parallel motions, and gear trains; machine tools; the application of the principles involved. Recitations, drawing, and the solution of problems. *Mr.* HALL.

Three hours. Seven hours of attendance. Through the year. Elective for students who have credit for 8. *Mon., 2.20 to 5.20; Wed. at 10.20; Fri., 10.20 to 1.20.*

11, 12. *Machine Design*

Applications of the principles of mechanics and the strength of materials to the design of representative types of boilers, engines, and various mechanisms; solution of problems illustrating the method of designing bolts and nuts, keys, journals and bearings, fly-wheels, valve gears, etc. Lectures, calculation, and drawing. *Mr.* HALL.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 9, 10, and Mechanics 2. *Mon., Th., 9.20 to 12.20.*

14. *General Engineering and Design*

Lectures; discussion of special engineering problems. *Professor* KENERSON *and Mr.* HALL.

Three hours. Second semester. *Tu., Th., Sat., at 8.*

15, 16. *Thermodynamics*

Applications of the principles of gases and vapors to steam, gas, and other heat engines, air-compressors, refrigerating apparatus, etc.; discussion of the energy of fuel and the utilization of such energy for power purposes by means of various media; laws of the relation of variations of pressure, temperature, and volume of such media; analysis of the various cycles used in heat engines; the principles of the injector and the ejector. *Professor* KENERSON *and Mr.* SHEDD.

Three hours. Through the year. Elective for students who have credit for Physics 1, 2. *Tu., Wed., Sat., at 9.20.*

17, 18. *Engineering Practice*

Applications of the principles of thermodynamics and mechanics to the production, transmission, utilization, and measurement of power; valves and valve gears, and valve setting; indicator practice and tests of various forms of steam engines, gas engines, etc.; standardization of auxiliary apparatus used in making the various tests; boiler testing; flue gas and fuel analysis, etc. Lectures, recitations, and laboratory work. *Professor* KENERSON *and Mr.* SHEDD.

Three hours. Through the year. Elective for students who have credit for or are taking 15, 16. First semester, *Wed., Fri., Sat., at 8.* Second semester, *Wed., Fri., at 8; Tu., 2.20 to 5.20.*

19, 20. *Materials of Engineering*

Study of the sources, manufacture, and properties of the important materials used in engineering; laboratory tests to determine the behavior of materials when subjected to tensile, compressive, and torsional stresses; mixing and testing of cements and mortars; preparation and examination of sections for the microscopical study of the structure of metals and alloys. Lectures, recitations, and laboratory work. *Professor* KENERSON *and Mr.* SHEDD.

Three hours. Through the year. Elective for students who have credit for or are taking Mechanics 1. *Tu., Fri., at 10.20,* and a two-hour laboratory period to be arranged with the instructor.

21. *Power Plant Engineering*

Discussion of the relation and coördination of the various parts of the complete power plant; management, and methods of determining efficiency; selection of the best equipment from manufacturers' catalogues and actual inspection. Lectures, recitations, tests, and tours of inspection. *Mr.* HALL.

Three hours. First semester. Elective for students who have credit for 15, 16. *Tu., 2.20 to 5.20; Tu., Th., at 8.*

22. *Advanced Laboratory Course*

Steam, gas, and power engineering. Conferences and Laboratory work. Particular emphasis laid on preparation and form of reports. *Professor* KENERSON, *Messrs.* HALL *and* SHEDD.

Three hours. Second semester. *Mon., Th., 2 to 5.*

24. *Applied Hydraulics*

Laboratory experiments in connection with Mechanics 4. *Professor* KENERSON.

One hour. Second semester. Must be taken with Mechanics 4.

25, 26. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Mechanical Engineering. The thesis must embody a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XVIII. MECHANICS AND MECHANICAL DRAWING

OTIS EVERETT RANDALL, PH.D., *Professor of Mechanics and Mechanical Drawing*

ANSEL BROOKS, PH.B., M.E., *Associate Professor of Mechanics and Mechanical Drawing*

PERRY BLAINE PERKINS, PH.D., *Assistant Professor of Mechanics*

JOHN JOSEPH LONG, PH.B., *Instructor in Mechanical Drawing*

MECHANICS

1, 2. *Mechanics of Solids*

Statics, including resolution and composition of forces, determination of center of gravity, and problems relative to rigid bodies and flexible cords; dynamics, including rectilinear and curvilinear motion, virtual velocity, moment of inertia, work, energy and power, and friction; strength of materials, including tension, compression, shearing, torsion, and flexure; methods of graphical solution of problems. *Professors* RANDALL *and* BROOKS.

Four hours. Through the year. Required of candidates for the degree of Bachelor of Science. Elective for students who have credit for Mathematics 7, 8. *Mon., Tu., at 11.20; Th., 10.20 to 12.20.*

3. *Mechanics of Fluids*

Hydrostatics; nature and use of instruments; flow through orifices, over weirs, through tubes, through pipes, in conduits; flow of rivers; water supply and water power. *Professors* Randall *and* Brooks.

Three hours. First semester. Required of candidates for the degree of Bachelor of Science. Elective for students who have credit for 1, 2. *Wed., Fri., Sat., at 11.20.*

4. *Applied Hydraulics*

Dynamics of water; theoretical consideration of water wheels, pumps, and pumping machinery. *Professors* Randall *and* Brooks.

One hour. Second semester. Required of candidates for the degree of Bachelor of Science. Elective for students who have credit for 3. Must be taken with Civil Engineering 34, and Mechanical Engineering 24. *Wed., Fri., Sat., at 11.20.* First five weeks of semester.

5, 6. *Mathematical Mechanics*

Comprehensive treatment of the principles of statics and dynamics; strength of materials; higher theoretical and practical problems. Intended primarily for students who are interested in the application of the principles of pure mathematics. *Professor* Brooks.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for Mathematics 7, 8.

MECHANICAL DRAWING

1. *Elementary Mechanical Drawing*

Nature, care, and use of drafting instruments; lettering; plane problem construction; curve tracing; elementary projection. *Professor* Brooks *and Mr.* Long.

Three hours. Six hours of drawing. First semester. Required in the Freshman year of candidates for the degree of Bachelor of Science. *Tu., Fri., 2.20 to 5.20.*

2. *Descriptive Geometry*

Discussion, proof, and graphic solution of problems relating to the point, line, and plane, line and surface generation and classification. *Professor* Brooks *and Mr.* Long.

Three hours. Two hours of recitation and three hours of drawing. Second semester. Required in the Freshman year of candidates for the degree of Bachelor of Science. *Tu., Fri., 2.20 to 5.20.*

3, 4. *Descriptive Geometry*

Discussion, proof, and graphic solution of problems relating to the point, line, and plane, line and surface generation and classification, surface tangency, intersections, and developments; application of the principles of descriptive geometry in isometric drawing, shades and shadows and perspective, machine drawing, and practical engineering problems. *Professor* BROOKS *and Mr.* LONG.

Three hours. Two hours of recitation and three hours of drawing. Through the year. Required in the Sophomore year of candidates for the degree of Bachelor of Science. Elective for students who have credit for 7, 8. *1st div., Mon., Fri., at 9.20; 2d div., Tu., Sat., at 10.20.*

7, 8. *Elementary Mechanical Drawing*

Nature, care, and use of drafting instruments; lettering; plane problem construction; curve tracing; elementary projection. *Mr.* LONG.

Three hours. Six hours of drawing. Through the year. Elective for Undergraduates. *Tu., Fri., 2.20 to 5.20.*

XIX. MUSIC

EDWIN ERNEST WILDE, *Lecturer in Music*

1, 2. *The Appreciation of Music*

The aim of this course is to increase the appreciation of music by acquainting the student with the various devices used in musical composition, tracing the development of musical form from the early folk-songs to the symphonic poems of our modern writers. Analytical study of important works of the representative composers from Bach to Wagner, Tschaikowsky, and Strauss. Lectures, illustrations by piano and victrola, and by soloists.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. *Mon., Wed., at 12.20,* and a third hour at the pleasure of the instructor.

XX. PHILOSOPHY

William Herbert Perry Faunce, A.M., D.D., LL.D., *Professor of Moral and Intellectual Philosophy*

Edmund Burke Delabarre, Ph.D., *Professor of Psychology*

Walter Goodnow Everett, Ph.D., *Professor of Philosophy and Natural Theology*

Alfred Harrison Jones, Ph.D., *Assistant Professor of Logic*

Clarence Edwin Ayres, A.B., *Assistant in Philosophy*

1, 2. *Logic*

The aims, methods, and principles of thought; designed to introduce the student to the study of philosophy through a criticism of the nature and limits of science and philosophy, and an estimate of their validity for religion and life. *Professor* Jones.

Three hours. Through the year. Elective for Sophomores and Juniors. *Mon., Th., Fri., at 9.20.*

3, 4. *Psychology and Ethics*

First semester, Psychology. A survey of the main facts and laws of mental life, aiming to provide a sound foundation for further acquaintance with this and allied subjects, for an improved judgment in dealing with many practical problems, and for understanding the psychological bases of philosophy. Second semester, Ethics. An introductory course dealing in a concrete way with the moral values of daily experience, and intended to aid the student in forming a practical philosophy of life. First semester, *Professor* Delabarre. Second semester, *Professor* Everett.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Either semester may be elected independently by Seniors only. *Tu., Wed., Sat., at 9.20.*

5, 6. *Psychology, Intermediate Course*

A study of the fundamental principles on which a scientific system of psychology must be based. The nature and composition of consciousness, its relation to bodily processes, and its complete subjection to law. The criteria for accepting evidence and forming sound judgments in connection with the problems of so-called "psychical research." *Professor* Delabarre.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for a course in Psychology.

7, 8. *History of Philosophy*

The successive philosophical systems as revealing the logical development of European philosophy. The treatment also aims to exhibit the significant relations which philosophy has sustained to civilization, especially in its fundamental political, scientific, religious, and cultural elements. *Professor* EVERETT.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

9. *Philosophy of Religion*

A constructive study of the nature of the religious consciousness, and of the ultimate problems of religious belief. *Professor* EVERETT.

Three hours. First semester. Elective for Juniors, Seniors, and Graduates who have credit for a year course in Philosophy. *Wed., Fri., Sat., at 11.20.*

10. *Applications of Psychology*

Description of some of the important ways in which the principles of psychology are being practically applied to the problems of modern life. *Professor* DELABARRE.

Three hours. Second semester. Elective for students who have credit for 3. *Tu., Wed., Sat., at 9.20.*

11, 12. *Experimental Psychology, Introductory Laboratory Course*

Description of the main lines and results of experimental research; demonstrations by the instructor or the class; training in the use of apparatus and in careful scientific observation and measurement. *Professor* DELABARRE.

Three hours. Six hours of attendance. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 3.

13, 14. *Current Tendencies in Philosophy*

A course designed to introduce the student to the more important philosophical theories of the present day, as illustrated in the work of such representative thinkers as Spencer, Royce, James, Bergson, and Russell. *Professor* JONES.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Wed., Fri., Sat., at 11.20.*

25, 26. *Idealism and Realism*

A seminary for the study of idealistic and realistic theories of philosophy. Especial attention will be devoted to the New Realism of the present day. *Professor* JONES.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for a year course in Philosophy.

30. *History of Religion*

An outline study of the history of the principal religions of the world. This course is the same as Course 30 offered by the Department of Biblical Literature and History. *Professors* FOWLER *and* JONES.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

17, 18. *Psychology, Advanced Course*

A seminary for the discussion of important problems in psychology. The problems discussed will vary, and the course may be taken for two or more years. *Professor* DELABARRE.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for 5, 6.

19, 20. *Experimental Psychology, Advanced Laboratory Course*

The aim is to study further the problems of experimental psychology, and, whenever possible, to make original contributions to scientific knowledge. The problems investigated will vary, and the course may be taken for two or more years. *Professor* DELABARRE.

One to six hours. Two to twelve hours of attendance. Through the year. Elective for students who have credit for 11, 12. May be taken for more than six hours by Graduates.

[21, 22. *Advanced Ethics*]

A seminary course for the study of the more important problems of ethical theory. Lectures, written reports, and discussions.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for a year course in Philosophy. Not offered in 1914–15.

23, 24. *Philosophical Seminary*

A seminary for the study of the problems of historical and contemporary thought. Reading, written reports, and discussions. Subject for 1914–15: Contemporary Studies in the Philosophy of Religion, based chiefly upon the works of Hoeffding, Royce, Hocking, Leuba, and Eucken. *Professor* EVERETT.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for a year course in Philosophy.

XXI. PHYSICS

Carl Barus, Ph.D., LL.D., *Hazard Professor of Physics*
Albert deForest Palmer, Ph.D., *Associate Professor of Physics*
Arthur Eugene Watson, Ph.D., *Assistant Professor of Physics*
Robert Franklin Field, A.M., *Instructor in Physics*
Frank Carleton Blake, Sc.B., *Assistant in Physics*

1, 2. *Elementary Physics* ‡

Designed for those who have had little previous training in physics. First semester, dynamics, molecular physics, and heat. Second semester, optics, acoustics, and electricity. Discussion of the more elementary features of the subjects. Lectures illustrated by experiments and the lantern; weekly written exercises. *Professor* Barus.

Three hours. Through the year. Elective for Undergraduates who have credit for entrance algebra and plane geometry. *Mon., Wed., Th., at 10.20.*

27, 28. *Elementary Physics*

Identical with 1, 2, except that the written exercises mentioned will be replaced by problems solved in an additional hour in the classroom. D. E. Jones's *Examples in Physics* (Macmillan) are to be used. *Professor* Barus *and Mr.* Field.

Three hours. Through the year. Four hours of attendance. Required of all candidates for the degree of Bachelor of Science. *Mon., Wed., Th., at 10.20.* Extra hour to be assigned. (Probably *Fri. at 11.20.*)

3, 4. *Elementary Physics, continued* §

Treats the more advanced parts of the subjects taken in the same order as in 1, 2. *Professor* Barus.

Three hours. Through the year. Elective for students who have credit for 1, 2, and Mathematics 1, 2. *Tu., Fri., Sat., at 10.20.*

5, 6. *Experimental Physics*

An introduction to the theory and practice of physical manipulation. Experimental study of physical phenomena selected to meet the needs of individual students. Written reports and solution of problems. *Professor* Palmer.

Three hours. Six hours of attendance. Through the year. Elective for students who have credit for 1, 2.

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‡ Students who intend to teach Physics should elect courses 1, 2; 3, 4; 5, 6.

§ Graduates taking course 3, 4 are held responsible for all the demonstrations, or for the full equivalent of either Watson's or Daniel's *Principles of General Physics.*

7, 8. *Mathematical Treatment of Dynamical Problems* ‡

First semester, discussion of the general principles of dynamics and the development of the general equations of motion. Second semester, application of these principles to special problems in thermodynamics and hydrodynamics. *Professor* PALMER.

Three hours. Through the year. Elective for Seniors and Graduates who have credit for 5, 6, and Mathematics 9, 10.

9, 10. *Mathematical Theory of Electricity and Magnetism* ‡

Includes a discussion of the more important problems of electrical science. *Professor* PALMER.

Three hours. Through the year. Elective for Graduates and Seniors who have credit for 5, 6, and Mathematics 9, 10.

11, 12. *Advanced Laboratory Course*

Special problems and reference to original sources for methods of solution. *Professors* BARUS, PALMER, *and* WATSON.

Three or six hours. Six or twelve hours of attendance. Through the year. Elective for students who have credit for 5, 6.

13, 14. *Applied Harmonic Analysis and Applied Vector Analysis* §

Importance of Fourier's method shown by examples drawn from the analytical theory of heat, from elastics, alternating electricity, and elsewhere; treatment by the aid of spherical harmonics. Bessel functions and Lamé functions; the chief theorems of vector analysis deduced and applied to dynamics, elastics, hydrodynamics, the electro-magnetics of Maxwell and Hertz, and the electronic theory of Heaviside, Lorentz, and others. *Professor* BARUS.

Three hours. Through the year. Required in the second semester of candidates for the degree of Bachelor of Science in Electrical Engineering. Elective for Seniors and Graduates who have credit for 1, 2, and Mathematics 7, 8.

15, 16. *Physics, Advanced Course* §

Lectures on dynamics, potential, elastics, hydrostatics, hydrodynamics, viscosity, capillarity, electrostatics, magnetism, electro-magnetism, thermo-electrics, induction, Fresnel's optics, the electromagnetic theory of light, thermal analytics, and thermodynamics. *Professor* Barus.

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‡ In determining which of the two courses 7, 8, and 9, 10, shall be offered in any given year, the preference of students will be considered.

§ In determining the content of courses 13, 14, and 15, 16, the preference of students will be considered.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates who have credit for Mathematics 7, 8.

21, 22. *Theory of Measurements*

Lectures and recitations on the theory and precision of measurements, and on methods of taking, recording, and reducing observations; laboratory instruction in selected physical measurements. *Professor* Palmer *and Mr.* Blake.

Three hours. Five hours of attendance. Through the year. Required of candidates for the degree of Bachelor of Science. Elective for students who have credit for 1, 2, and Mathematics 7, 8, or 19, 20. *Mon., Fri., at 12.20.* Laboratory hours will be posted in 11 Wilson Hall on the first day of each term.

23, 24. *Precision Measurements in Photometry, Electricity, and Magnetism*

Professor Palmer.

Four hours. Eight hours of attendance. Through the year. Elective for students who have credit for 5, 6, or 21, 22, and Mathematics 7, 8, or 19, 20.

25, 26. *Radiation, Optics, and Heat*

Experimental study of selected phenomena; demonstrations and personal conferences. *Professor* Palmer.

Three or six hours. Six or twelve hours of attendance. Through the year. Elective for students who have credit for 5, 6, or 21, 22.

ELECTRICAL ENGINEERING‡

Professor Watson *and Mr.* Field

1, 2. *Introductory Technical Course*

Fundamental principles of electricity and magnetism; theory of dynamo-electric machinery; methods of generating and utilizing direct currents; characteristics of generators and motors.

Three hours. Two hours of recitation and two hours of laboratory work. Through the year. Elective for students who have credit for Physics 1, 2, or 27, 28, and Mathematics 5 or 18. Required of candidates for the degree of Bachelor of Science in Mechanical Engineering. *Tu. at 10.20; Fri. at 9.20.*

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‡ All the courses in this department, except 3, are required of candidates for the degree of Bachelor of Science in Electrical Engineering.

3. *Elementary Electrical Engineering*

A short course covering the methods of generating, transmitting, distributing, and utilizing electrical energy.

Three hours. Two hours of recitation and two hours of laboratory work. First semester. Elective for students who have credit for Physics 1, 2, or 27, 28, and Mathematics 5 or 18. Required of candidates for the degree of Bachelor of Science in Civil Engineering. *Mon., Th., at 9.20.*

[5. *Telegraph Engineering*]

History and present practice of telegraphic, signaling, and protective systems.

One hour. First semester. Elective for students who have credit for Physics 1, 2, or 27, 28. Not offered in 1914–15.

[6. *Telephone Engineering*]

Magneto and common-battery manual systems; automatic systems; equipment of central and branch exchanges.

Two hours. Second semester. Elective for students who have credit for 1 or 3. Not offered in 1914–15.

7. *Telephone and Telegraph Engineering*

Temporary combination of 5 and 6.

Three hours. First semester. Elective in 1914–15 for students who have credit for Physics 1, 2. *Mon., Th., Fri., at 10.20.*

8. *Direct Current Machine Design*

Calculation and design of generators, motors, and auxiliary apparatus.

Three hours. Second semester. Elective for students who have credit for 1. *Mon., 9.20 to 11.20; Th. at 9.20.*

9. *Theory of Alternating Currents*

A mathematical and graphical treatment of circuits containing resistance, inductance, and capacity. Principles of alternating current machinery.

Three hours. Two hours of recitation and two hours of laboratory work. First semester. Elective for students who have credit for 2 and Mathematics 20. After 1914–15, four hours. Three hours of recitation and two hours of laboratory work. *Mon., Th., at 9.20.*

10. *Alternating Current Machinery*

Methods of generating and utilizing alternating currents; characteristics of generators, motors, converters, and transformers.

Three hours. Two hours of recitation and two hours of laboratory work. Second semester. Elective for students who have credit for 2. *Wed., Fri., at 10.20.*

[11. *Alternating Current Machinery*]

Identical with 10, and to be substituted for it after 1916–17.

Three hours. First semester. Not offered in 1914–15.

14. *Alternating Current Machine Design*

Calculation and design of generators, motors, transformers, and auxiliary apparatus.

Three hours. Four hours of attendance. Second semester. Elective for students who have credit for 9. *Mon., Fri., at 9.20; Mon., Tu., at 10.20.*

16. *Traction and Transmission Engineering*

Electric railway systems and equipment; theory and design of high tension transmission lines and low tension net-works.

Three hours. Second semester. Elective for students who have credit for 11. *Mon., Tu., Th., at 11.20.*

17, 18. *Seminary in Electrical Engineering*

Reading and discussion of current technical literature.

One hour. Through the year. Elective for students who have credit for 2. 17 will not be offered until 1917–18. *Th. at 11.20.*

19, 20. *Thesis*

A thesis is required of all candidates for the degree of Bachelor of Science in Electrical Engineering excepting those who, with the permission of the head of the department, are allowed to substitute a regular three-hour course for one semester in some other department. The thesis must embody a design or a review of an engineering plant, appliance, process, or structure, or the results of an experimental investigation.

XXII. ROMAN LITERATURE AND HISTORY

ALBERT GRANGER HARKNESS, A.M., LITT.D., *Professor of Roman Literature and History*

JOHN FRANCIS GREENE, A.M., *Associate Professor of Roman Literature and History*

1. *Livy*

Designed to enable the student to acquire facility in reading Latin, and to instruct him in the use of the Latin texts as a means of gaining a knowledge of Roman history. Grammatical study and literary criticism also receive attention. *Professors* HARKNESS *and* GREENE.

Three hours. First semester. Elective for students who presented elementary and advanced Latin for admission. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Tu., Th., Sat., at 12.20.*

2. *Cicero's Letters*

Aims and methods as in 1. *Professors* HARKNESS *and* GREENE.

Three hours. Second semester. Elective for students who presented elementary and advanced Latin for admission. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Tu., Th., Sat., at 12.20.*

3. *Horace's Odes and Epodes, Tibullus, Propertius*

Critical study of the poems, supplemented by rapid reading with a view to comprehending the spirit of the author. The literary side of the study is made prominent. Lectures; literary topics assigned to the class for special study. *Professor* GREENE.

Three hours. First semester. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

4. *Horace's Satires and Epistles, Juvenal*

Aims and methods as in 4. *Professor* HARKNESS.

Three hours. Second semester. Elective for Sophomores. *Mon., Wed., Fri., at 12.20.*

[5, 6. *Latin Poetry*]

Aims to give a connected and comprehensive view of the history and development of Latin poetry. Lectures on the lives and writings of the authors; reading of characteristic selections; special study by members of the class of assigned topics in literary history and criticism. First semester, Plautus. Second semester, Lucretius and Catullus.

Forms with 7, 8 a two-year consecutive course, affording a general survey of Roman literature.

Three hours. Through the year. Elective for Juniors and Seniors. Either semester may be elected independently. Not offered in 1914–15.

7, 8. *Latin Prose*

Aims to give a connected and comprehensive view of the history and development of Latin prose. Lectures on the lives and writings of the authors, on the development of oratory, etc.; reading of characteristic selections; special study, by members of the class, of assigned topics in literary history and criticism. First semester, specimens of early Latin, Cicero's *Brutus,* and Quintilian. Second semester, the *Annals* of Tacitus. Forms with 5, 6 a two-year consecutive course, affording a general survey of Roman literature. *Professors* HARKNESS *and* GREENE.

Three hours. Through the year. Elective for Juniors and Seniors. Either semester may be elected independently. *Tu., Wed., Sat., at 9.20.*

9, 10. *Petronius, Pliny the Younger, Martial*

Professor HARKNESS.

One hour. Through the year. Elective for Juniors, Seniors, and Graduates. *Fri. at 2.20.*

[11, 12. *Latin Composition*]

Professor GREENE.

One hour. Through the year. Elective for Sophomores, Juniors, and Seniors. Not offered in 1914–15.

13, 14. *History of the Roman Empire*

The Early Empire. The Age of the Antonines. The Age of Constantine. *Professor* GREENE.

Three hours. Through the year. Elective for Sophomores, Juniors, and Seniors. Either semester may be elected independently. *Tu., Wed., Sat., at 9.20.*

16. *Roman Civilization*

An outline of Roman civilization and its influence on modern times. Special attention will be given to the literature and to the political and social life. No knowledge of Latin required. Must be preceded in the first semester by Greek 15, Greek Civilization. The two semesters together constitute the course in Classical Civilization. *Professors* HARKNESS *and* GREENE.

Three hours. Second semester. Required in the Freshman or Sophomore year of candidates for the degree of Bachelor of Philosophy. Not elective. *1st div., Mon., Th., Fri., at 9.20; 2d div., Mon., Tu., Th., at 11.20.*

16 B. *Roman Civilization*

This course covers the same ground as 16.

Elective for Juniors and Seniors who have not taken 16. Followed in the second semester by Greek 15 B. Three hours. First semester. *Tu., Fri., Sat., at 10.20.*

17, 18. *Seminary in Latin*

Subject for 1913–14: Reading from the poetry of the Empire. Gudeman's *Latin Literature of the Empire*, vol. II. Questions in textual criticism and in the structure of Latin verse will be considered. *Professors* HARKNESS *and* GREENE.

Three hours. Two hours of attendance. Through the year. Elective for Graduates.

XXIII. ROMANCE LANGUAGES AND LITERATURES

COURTNEY LANGDON, A.B., *Professor of the Romance Languages and Literatures*

ALBERT BUSHNELL JOHNSON, A.M., *Associate Professor of the Romance Languages and Literatures*

CHARLES HERMAN HUNKINS, DR. *de l'Université de Paris, Assistant Professor of the Romance Languages and Literatures*

HENRI FELIX MICOLEAU, *Instructor in French*

1, 2. *Elementary Course, First Year*

Grammar, composition, dictation, conversation; translation of selections from modern authors into idiomatic English. *Mr.* MICOLEAU.

Three hours. Through the year. Elective for students who did not present French for admission. *1st div., Tu., Th., Sat., at 8; 2d div., Mon., Wed., Fri., at 8.*

3, 4. *Elementary Course, Second Year*

Reading of easy modern French prose in the form of stories, plays, or historical or biographical sketches; review of grammar; composition and conversation based upon the texts read. *Professors* JOHNSON *and* HUNKINS.

Three hours. Through the year. Elective for students who have credit for 1, 2, or who presented elementary French (1 year) for admission. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Mon., Wed., Fri., at 8.*

5, 6. *Intermediate Course*

Reading of modern and classical authors; review of grammar; composition and conversation based upon the texts read; dictation. *Professor* HUNKINS *and Mr.* MICOLEAU.

Three hours. Through the year. Elective for students who have credit for 3, 4, or who presented elementary French (2 years) for admission. *1st div., Wed., Fri., Sat., at 11.20; 2d div., Tu., Wed., Sat., at 9.20; 3d div., Mon., Th., Fri., at 9.20.*

7, 8. *Advanced Course*

An introduction to classical and modern French literature; composition; conversation based on the texts read; dictation. *Professors* JOHNSON *and* HUNKINS, *Mr.* MICOLEAU.

Three hours. Through the year. Elective for students who have credit for 5, 6, or who presented intermediate French for admission. *1st div., Mon., Th., Fri., at 9.20; 2d div., Wed., Fri., Sat., at 11.20; 3d div., Mon., Th., Fri., at 9.20.*

[9, 10. *The Realistic School*]

Flaubert, Augier, the younger Dumas, the Goncourts, Daudet, Zola, Taine, Loti, and others; abstracts, in French, of works read outside the class; sight reading a prominent feature.

Three hours. Through the year. Elective for students who have credit for 7, 8. Not offered in 1914–15.

11, 12. *The Romantic School*

The history of the romantic school; reading of authors from Chateaubriand and Victor Hugo to Rostand; abstracts on outside reading. Lectures in English and in French. *Professor* LANGDON.

Three hours. Through the year. Elective for students who have credit for 7, 8. *Mon., Wed., Th., at 10.20.*

13, 14. *The Classical School*

The history of the classical school; its formation, its apogee, and its decline. Lectures in French. *Mr.* MICOLEAU.

Three hours. Through the year. Elective for students who have credit for 9, 10, or 11, 12, and for approved students who have credit for 7, 8. *Mon., Tu., Th., at 11.20.*

15, 16. *Modern Spanish*

Grammar, conversation, composition, and reading of modern authors. *Professor* Johnson.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern language. *Tu., Fri., Sat., at 10.20.*

17, 18. *Modern Italian*

Grammar, composition, and reading of modern authors. *Professor* Langdon.

Three hours. Through the year. Elective for Juniors and Seniors, and for Sophomores not electing more than one other modern language. *Mon., Th., Fri., at 9.20.*

19, 20. *Dante in English*

A study of the whole of the *Divina Commedia* in English, in the light of modern thought and of other world-poems. *Professor* Langdon.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. Students are advised to elect this course in their Senior year. *Mon., Tu., Th., at 11.20.*

[21, 22. *Spanish Language and Literature*]

Selected works of classical and modern authors; composition; conversation.

Three hours. Through the year. Elective for students who have credit for 15, 16. Not offered in 1914–15.

23, 24. *Practice in Writing and Speaking French*

Intended especially for those preparing to teach. Written and oral translations from English into French. Conversation; dictation; phonetics. *Professor* Johnson.

Three hours. Through the year. Elective for students who have credit for 7, 8. *Mon., Tu., Th., at 11.20.*

XXIV. SOCIAL AND POLITICAL SCIENCE‡

JAMES QUAYLE DEALEY, PH.D., *Professor of Social and Political Science*

JOHN CORLISS DUNNING, LL.B., PH.D., *Assistant Professor of Political Science*

LUCIUS MOODY BRISTOL, PH.D., *Assistant Professor of Sociology*

SOCIAL SCIENCE§

1. *Elementary Social Science*

This course aims to present a general outline of sociological teachings, a brief discussion of some of the more important modern social problems, and a study of the rise and development of the family. *Professor* DEALEY.

Three hours. First semester. *Mon., Wed., Fri., at 12.20.* A year course consisting of Economics 1, and either Social Science 1 or Political Science 1, is required in Sophomore, Junior, or Senior year of candidates for the degree of Bachelor of Arts and Bachelor of Philosophy, and in Sophomore year of candidates for the degree of Bachelor of Science. These courses will be given in two sections. For the first section Economics will be given in the first semester and Political Science in the second semester. *Tu., Fri., Sat., at 10.20.* For the second section Social Science will be given in the first semester and Economics in the second semester. *Mon., Wed., Fri., at 12.20.* Students must indicate their choice of sections on the registration card.

3, 4. *Social Problems and Conditions*

Modern social problems, such as poverty, intemperance, crime, immigration, and child welfare. Movements for social betterment, including improved housing, social centers, and civic recreation. Principles underlying social and philanthropic work. *Professor* BRISTOL.

Three hours. Through the year. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Fri., at 12.20.*

5. *Origin and Development of Society*

Formation and dispersion of primitive groups; union and coalescence of groups; origin of races; the race struggle; institutions growing out of the race struggle; development of social institutions and problems involved; stages of culture. *Professor* Bristol.

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‡ Semester courses in this department may be elected separately unless otherwise stated.

§ The advanced courses in Social Science are open only to students who have credit for Economics 1 and Social Science 1, but students who have completed Economics 1 and Political Science 1 may elect advanced courses in Social Science, provided that either Social Science 1 or 3 or 4 is first elected.

Three hours. First semester. Followed in second semester by 16. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

16. *Social Psychology*

Genesis of the social instincts. The individual and society. Psychology of the crowd; social suggestion and imitation. The psychology of social groups. Psychological principles underlying social order and progress. Applications of the principles of social psychology to modern social problems. *Professor* Bristol.

Three hours. Second semester. Elective for Juniors, Seniors, and Graduates. *Tu., Th., Sat., at 12.20.*

7. *Sociology as a Science*

Relation of sociology to other sciences and its fundamental teachings; the principles underlying the development of society and its great social institutions. *Professor* Dealey.

Three hours. First semester. Followed in the second semester by 8. Elective for Juniors, Seniors, and Graduates. *Mon., Tu., Th., at 11.20.*

8. *Sociology in its Applications*

Sociological principles and teachings in respect to social progress in its chief aspects. A survey of the constructive trend in modern civilization. *Professor* Dealey.

Three hours. Second semester. Preceded in the first semester by 7. Elective for Juniors, Seniors, and Graduates. *Mon, Tu., Th., at 11.20.*

11, 12. *Seminary in Sociology*

First semester, a study of ancient and medieval teachings relating to society and social progress. The great precursors of sociology in the eighteenth century. Second semester, a survey of the chief sociological systems set forth since the beginning of the nineteenth century, and the influence exerted by these on the life and institutions of modern society. *Professor* Dealey.

Three hours. Through the year. Elective for Seniors and Graduates. *Mon., Th., 4.30 to 6.* Not to be offered in 1915–16.

13, 14. *Training Course for Social Service*

Practical work in connection with the Society for Organizing Charity and other approved social organizations. Study of methods of gathering, interpreting, and presenting data in the study of social problems. Investigation of one or more specific problems. *Professor* Bristol.

Three hours. Five hours of field work and one hour of classroom discussion. This course must be preceded or accompanied by Social Science 3, 4. Through the year. Elective for Graduates and for a limited number of approved Juniors and Seniors. *Fri., 5 to 6.*

POLITICAL SCIENCE‡

1. *Elementary Political Science*

(*See* Social Science 1.) A study of political development, the forms and functions of government, and the growth of modern democracy. Illustrative material will be drawn chiefly from the political systems and problems of English-speaking peoples. *Professor* Dealey.

Three hours. Second semester. *Tu., Fri., Sat., at 10.20.*

3, 4. *Government and Politics of the United States*

First semester, national government, its organization, powers, and methods; current political issues. Second semester, state and municipal governments; framework and activities of European and American municipalities. *Professor* Dunning.

Three hours. Elective for Juniors, Seniors, and Graduates. *Mon., Th., Fri., at 9.20.*

5. *Governments and Politics of Foreign States*

The political systems of typical leading states, including some of the states of Latin-America. Current international political situations and problems. *Professor* Dunning.

Three hours. First semester. Followed in the second semester by 6. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

6. *International Law*

The development of the science of International Law. The general principles guiding the relations of states. Illustrative concrete cases. *Professor* Dunning.

Three hours. Second semester. Preceded in the first semester by 5. Elective for Juniors, Seniors, and Graduates. *Mon., Wed., Th., at 10.20.*

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‡ The advanced courses in Political Science are open only to those students who have credit for Economics 1 and Political Science 1. But students who have completed Economics 1 and Social Science 1 may elect advanced courses in Political Science, provided that either Political Science 1 or 3 or 4 is first elected.

7. *Jurisprudence*

An analysis of the fundamental concepts of the science of Law. The historical development of Roman and English legal systems. *Professor* DUNNING.

Three hours. First semester. Followed in the second semester by 8. Elective for Seniors and Graduates. *Tu., Wed., Sat., at 9.20.*

8. *Constitutional Law*

Principles and development of American constitutional law. Case system. *Professor* DUNNING.

Three hours. Second semester. Preceded in the first semester by 7. Elective for Seniors and Graduates. *Tu., Wed., Sat., at 9.20.*

[9, 10. *Seminary in Political Science*]

A study of ancient and modern political theories. Rise of modern democratic principles. Present theories in respect to the state; its origin, sovereignty, and forms of government.

Three hours. Through the year. Elective for Seniors and Graduates. Not offered in 1914–15.

13, 14. *Investigation of Special Topics*

Intended to train students in methods of gathering and presenting data in the study of political problems. In connection with this course, work in comparative legislation may be taken under the direction of the Legislative Reference Bureau of the State Library. *Professor* DUNNING.

Three hours. Five hours of investigation and one hour of classroom work. Through the year. Elective for Graduates, and for a limited number of approved Seniors. *Th., 5 to 6.*

PHYSICAL TRAINING

FREDERICK WILLIAM MARVEL, PH.B., *Professor of Physical Training*
IRA LLOYD LETTS, PH.B., *Assistant in Physical Training*
LUCIEN JOSEPH GAY, *Instructor in Heavy Gymnastics*
CHARLES HENRY HUGGINS, *Instructor in Swimming*
GEORGE FRANKLIN HERRICK, *Instructor in Wrestling*

From Thanksgiving to the Spring Recess, all first and second year students are required to attend gymnasium exercises three times a week as follows:

Freshmen. *1st div., Tu., Fri., Sat., at 10.20 ; 2d div., Mon., Tu., Th., at 4.20.*

Sophomores. *1st div., Mon., Wed., Th., at 10.20; 2d div., Tu., Th., Fri., at 3.20.*

A voluntary class for Juniors and Seniors will be held on *Mon., Tu., Fri., at 5.10.* Classes in heavy gymnastics, under the direction of a special instructor, are held six afternoons a week. Classes in wrestling, under the direction of a special instructor, are held six afternoons a week. Instruction in swimming, under the direction of a special instructor, is given by appointment.

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